Prevention and control of Viral Hepatitis in Brazil and other Latin American countries, lessons learnt and the way forward

Brasilia, Brazil, 19-21 March 2014

Viral Hepatitis

Prepared by
Greet Hendrickx
VHPB Secretariat

Executive VHPB Secretariat, Vaccine and Infectious disease Institute, University of Antwerpen, Campus Drie Eiken, Universiteitsplein 1, BE-2610 Antwerpen, Belgium, ☏ +32 (0)3 265 26 64 ✉ +32 (0)3 265 26
This pre-meeting document contains general information on the Israel and a list of selected abstracts/references from a Pubmed MEDLINE search on different search terms. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.

1. **PART I:**
   **VIRAL HEPATITIS PREVENTION BOARD** pag. 3

2. **PART II**
   **Overview of viral hepatitis in Latin America** pag. 9

   Pubmed MEDLINE search on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Latin America) NOT autoimmune in all fields, filter (REVIEW and since 10 year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Latin America were selected.

   - 2.1 Argentina pag. 13
   - 2.2 Bolivia pag. 26
   - 2.3 Chili pag. 28
   - 2.4 Colombia pag. 29
   - 2.5 Costa Rica pag. 34
   - 2.6 Equador pag. 35
   - 2.7 Paraguay pag. 36
   - 2.8 Peru pag. 37
   - 2.9 Uruguay pag. 41
   - 2.10 Venezuela pag. 42

3. **PART III**
   **Prevention and control of viral hepatitis in Brazil** pag. 48

   - 3.1 Brazil general background pag. 48
   - 3.2 Burden of viral hepatitis in Brazil pag. 49
     Burden
     Carcinoma/transplantation pag. 49
   - 3.3 Epidemiology of viral hepatitis in Brazil pag. 51
   - 3.4 Viral hepatitis in Risk groups in Brazil pag. 60
     Risk groups pag. 62
     Co-infection pag. 66
   - 3.5 Prevention and control of viral hepatitis in Brazil pag. 67
     Prevention pag. 67
     Control pag. 71

4. **Bibliography speakers** pag. 76
PART I. Viral Hepatitis Prevention Board (VHPB)

Structure

The VHPB advisory board, set up in 1992, is composed of independent experts in the field of viral hepatitis and representatives of partner organizations (WHO, CDC, ECDC, ELPA). In 2013, the board counts 35 members, representing 17 different countries. In addition to the permanent group of experts, according to the treated topics the VHPB invites key experts for its meetings.

Since 1994, the executive secretariat of the board is based at the VAXINFECTIO unit of the University of Antwerp, Belgium, under the head of Prof. Pierre Van Damme.

Mission statement

The objective of the VHPB is to contribute to the control and prevention of viral hepatitis by drawing the attention to this important public health problem and encouraging actions to improve control and prevention.

During the past 20 years, the VHPB has been actively involved in promoting WHO’s vaccination and screening recommendations for countries in the WHO-EURO region (53 countries). In line with WHO’s Framework for Global Action for the Prevention and Control of Viral Hepatitis Infection, the VHPB wants to expand its scope to secondary and tertiary prevention (care and treatment), necessary to achieve a meaningful degree of prevention and protection.

VHPB has, in support of its main objective, a wide range of technical as well as strategic functions, including the following:

- bring together, during VHPB meetings, an international forum of specialists to examine, discuss, and judge on specific topics;
- produce and distribute a number of publications, including Viral Hepatitis, a newsletter on viral hepatitis and reports of VHPB meetings;
- disseminate viral hepatitis control and prevention guidelines for health care workers and policymakers;
- closely collaborate with international agencies dealing with control and prevention of viral hepatitis (WHO, CDC, ECDC, EC, NGO’s);
- organize international meetings to facilitate the introduction of immunization programs;
- promote the implementation of WHO recommendations on viral hepatitis control and prevention;
- assist implementation of national plans of action for the introduction of vaccines;
- assist countries in decision making process regarding prevention and control of viral hepatitis.
Focus audiences

Opinion leaders, policymakers and health care professionals.

Achievements

The VHPB organises at least two meetings per year. Since 1992, 37 VHPB meetings were organized. Based on the meetings, 37 Viral hepatitis newsletters were published and distributed to over 3000 readers and more than 80 peer reviewed papers published. Representatives of the Board are frequently invited as speaker or expert at international meetings, regulatory bodies e.g. European Agency for the Evaluation of Medicinal Products (EMEA) and advisory groups e.g. European Technical Advisory Group of Experts on Immunization (ETAGE).

Upcoming meetings

In November 2013, a VHPB meeting in Croatia will focus on the prevention and control of hepatitis C, giving an overview of screening strategies and the current and future hepatitis C therapy developments. In March 2014, the VHPB will support a meeting on the prevention and control of viral hepatitis in Brazil and Latin America.

Sources of support

The VHPB is supported by unrestricted grants from the pharmaceutical industry (GlaxoSmithKline Biologicals, Merck and Sanofi Pasteur MSD) and by direct and indirect support from several universities in Europe and other institutions. For 2014, additional funding sources involved in care and treatment will be invited to support our future activities.

Website: www.vhpb.org.
## Composition of the advisory board

<table>
<thead>
<tr>
<th>WHO</th>
<th>Academic/University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nedret Emiroglu</td>
<td>Selim Badur, Turkey</td>
</tr>
<tr>
<td>Stefan Wiktor</td>
<td>Paolo Bonani, Italy</td>
</tr>
<tr>
<td>ECDC</td>
<td>Angela Dominguez, Spain</td>
</tr>
<tr>
<td>Erika Duffel</td>
<td>Wolfgang Jilg, Germany</td>
</tr>
<tr>
<td>CDC</td>
<td>Helène Norder, Sweden</td>
</tr>
<tr>
<td>John Ward</td>
<td>Vana Papaevangelou, Greece</td>
</tr>
<tr>
<td>ELPA (European Liver patient association)</td>
<td>Françoise Roudot-Thoraval, France</td>
</tr>
<tr>
<td>Tatjana Reic</td>
<td>Rui Tato Marinho, Portugal</td>
</tr>
<tr>
<td>Public Health Institute</td>
<td>Daniel Shouval, Israel</td>
</tr>
<tr>
<td>Hans Blystad</td>
<td>Pierre Van Damme, Belgium</td>
</tr>
<tr>
<td>David Goldberg</td>
<td>Koen Van Herck, Belgium</td>
</tr>
<tr>
<td>Mira Kojouharova</td>
<td>Alessandro Zanetti, Italy</td>
</tr>
<tr>
<td>Johannes Hallauer</td>
<td></td>
</tr>
</tbody>
</table>

## Honorary Members

| Pietro Crovari                          | Italy | Eric Mast | USA                   |
| Alain Goudeau                           | France | Elisabeth McCloy | USA                |
| Nicole Guérin                           | France | André Meheus, Belgium |
| Peter Grob                              | Swiss  | Lars Rombo, Sweden |
| Mark Kane                               | USA    | Colette Roure, France |
| Harold Margolis                         | Korea  | Daniel Lavanchy, Switzerland (WHO) |
| Steven Wiersma                          | USA (WHO) |                                                    |

## VHPB Bibliography (last 10 years)


The Viral Hepatitis Prevention Board (VHPB) organized an international meeting in Milan in November 2011 on the question of whether completing a course of hepatitis B vaccination confers lifelong protection against...
hepatitis B virus infection and its complications. Presentations covered vaccine efficacy including factors influencing long-term protection; breakthrough infections; the immunological effect of natural boosting; the effectiveness of universal hepatitis B vaccination in different countries, and issues relating to national, regional and global policies on booster vaccination. Findings from four continents were presented at the meeting, with data now extending to follow-up for nearly 30 years after full primary vaccination. The results reported add to the extensive and growing body of knowledge, demonstrating that in spite of subsequent decline and ultimate loss of detectable serum anti-HBs, a full primary course of hepatitis B vaccine confers complete protection against acute clinical disease and chronic hepatitis B infection for long periods of time. Our understanding of the role and functions of T and B cells in protective immunity deepens, although the picture is still complex. A framework for future work in several areas emerged from the meeting, including monitoring and surveillance of vaccination programmes, breakthrough infections, hepatitis B in immigrant populations, and vaccine-escape viral mutants. One further concrete recommendation is the setting up of a working group to standardize definitions on terms such as “immunity”, “protection”, “immune memory”, “non-responders”, “long-term”, “anamnestic response”, “breakthrough” and “vaccine failure”.


**PURPOSE OF REVIEW:** This review offers an update on hepatitis A, B and E vaccines based on relevant literature published in 2011-2012. Hepatitis A and B vaccines have been commercially available for years; however, the development of the hepatitis E vaccine is still facing some challenges. **RECENT FINDINGS:** Current scientific evidence shows that both hepatitis A and B vaccines confer long-term protection. These data supported the updated recommendations from the WHO on hepatitis A and B vaccines and the respective booster policy. In addition, a single-dose hepatitis A vaccination programme may be an option for some intermediate endemic countries, as far as the epidemiological situation is further monitored. Recent data illustrate the co-administration of hepatitis A with infant vaccines, as well as the interchangeability with other hepatitis A vaccines. Two genetically engineered hepatitis E vaccines are currently in development, showing more than 95% protective efficacy. **SUMMARY:** Follow-up of vaccinated individuals confirms the long-term protection offered by the hepatitis A as well as hepatitis B vaccines. Data confirm the safety and immunogenicity profile of both vaccines, also when used in patient groups. The first data on the hepatitis E vaccine look promising, but questions on cross-protection, long-term efficacy and safety and immunogenicity in pregnant women and children less than 2 years remain unanswered.


A meeting of the Viral Hepatitis Prevention Board in Sofia, Bulgaria on 24-25 March 2011 reviewed the burden and prevention of viral hepatitis in the country. It examined the organization and funding of the health system, the surveillance systems for infectious diseases, and the epidemiology of viral hepatitis, especially the impact of the universal neonatal hepatitis B immunization programme introduced almost 20 years ago. It also looked at the implementation of new prevention strategies, such as the health mediator concept, as well as control measures and monitoring systems. Participants discussed the successes, the way forward and possible obstacles.


Immunisation is one of the corner stones of public health. Most health care consumers see the health care worker as their major source of information on immunisation and vaccine safety. Doctors, nurses and midwives should be appropriately and timely trained for that role. Within the Vaccine Safety, Attitudes, Training and Communication (VACSATC) EU-project a specific work package focused on the possible improvements of pre-service training of future health care workers. Surveys to assess current pre-service training about knowledge, skills and competences towards immunisation were distributed to students and curriculum managers of medical schools, universities and nursing training institutions in seven EU countries. In all responding institutions training on vaccines and immunisation is disseminated over a wide range of courses over several academic years. Topics as immunology and vaccine-preventable diseases are well covered during the pre-service training but major gaps in knowledge and competences were identified towards vaccine safety, communication with parents, addressing anti-vaccine arguments and practical skills. This assessment underlined the rationale for adequate pre-service training and identified opportunities for improvement of pre-service training. A prototype of an accurate pre-service immunisation curriculum was developed, implemented and evaluated in the summer of 2009 with a group of 36 students from 19 countries during a summer school on vaccinology at the Antwerp University, Belgium.


In March 2009 the Viral Hepatitis Prevention Board (VHPB) organized a meeting in Antwerp, in order to review the status of epidemiology and prevention of both hepatitis A and E. International hepatitis experts from the
BACKGROUND: European countries use a wide variety of surveillance systems and prevention measures for viral hepatitis. Each system is adapted to the local situation and an overview was never mapped out at European level. The information shared on HEV showed clearly that it is emerging, but still a lot of efforts are needed to clarify among others the transmission routes, the clinical presentations and the burden of disease. First data on hepatitis E vaccines were discussed, showing a promising safety and efficacy profile. The meeting was concluded with lessons learnt, challenges, needs and proposed step forwards for both diseases.


For the first time a global meeting on hepatitis A virus (HAV) infection as vaccine preventable disease was organized at the end of 2007. More than 200 experts from 46 countries gathered to investigate the changing global HAV epidemiology reflecting the increasing numbers of persons at risk for severe clinical disease and mortality from HAV infection. The benefits of childhood and adult hepatitis A (HepA) vaccination strategies and the data needed by individual countries and international health organizations to assess current HepA prevention strategies were discussed. New approaches in preventing HAV infection including universal HepA vaccination were considered. This introductory paper summarizes the major findings of the meeting and describes the changing epidemiology of HAV infections and the impact of HepA vaccination strategies in various countries. Implementation of HepA vaccination strategies should take into account the level of endemicity, the level of the socio-economic development and sanitation, and the risk of outbreaks. A stepwise strategy for introduction of HepA universal immunisation of children was recommended. This strategy should be based on accurate surveillance of cases and qualitative documentation of outbreaks and their control, secure political support on the basis of high-quality results, and comprehensive cost-effectiveness studies. The recognition of the need for increased global attention towards HepA prevention is an important outcome of this meeting.


The Viral Hepatitis Prevention Board (VHPB) convened a meeting of international experts from the public and private sectors in order to review and evaluate the epidemiology of blood-borne infections in healthcare workers, to evaluate the transmission of hepatitis B and C viruses as an occupational risk, to discuss primary and secondary prevention measures and to review recommendations for infected healthcare workers and (para)medical students. This VHPB meeting outlined a number of recommendations for the prevention and control of viral hepatitis in the following domains: application of standard precautions, panels for counselling infected healthcare workers and patients, hepatitis B vaccination, restrictions on the practice of exposure-prone procedures by infected healthcare workers, ethical and legal issues, assessment of risk and costs, priority setting by individual countries and the role of the VHPB. Participants also identified a number of terms that need harmonization or standardisation in order to facilitate communication between experts.


The Viral Hepatitis Prevention Board jointly organized with the European Union for School and University Health and Medicine a meeting on the prevention and control of viral hepatitis through adolescent health programmes in Europe, held in Ljubljana, Slovenia, 15-16 March 2007. Participants from some 16 countries in Europe as well as the United States of America emphasized the importance of reaching adolescents mainly through school health programmes, provided an overview of currently existing youth health systems and reviewed their experiences with childhood and adolescent immunization programmes. The meeting concluded with a discussion of issues, lessons learnt, opportunities and action points for the future.


BACKGROUND: European countries use a wide variety of surveillance systems and prevention measures for viral hepatitis. Each system is adapted to the local situation and an overview was never mapped out at European level. The EUROHEP.NET Project is a European Commission-funded feasibility study for a future network on surveillance and prevention of vaccine-preventable hepatitis. We analysed the measurement and reporting of burden of disease for hepatitis A (HA) and B (HB) in the participating countries. METHODS: Twenty-eight countries were considered. This introductory paper summarizes the major findings of the meeting and describes the new approaches in preventing HAV infection including universal HepA vaccination were considered. New approaches in preventing HAV infection including universal HepA vaccination were considered. This introductory paper summarizes the major findings of the meeting and describes the changing epidemiology of HAV infections and the impact of HepA vaccination strategies in various countries. Implementation of HepA vaccination strategies should take into account the level of endemicity, the level of the socio-economic development and sanitation, and the risk of outbreaks. A stepwise strategy for introduction of HepA universal immunisation of children was recommended. This strategy should be based on accurate surveillance of cases and qualitative documentation of outbreaks and their control, secure political support on the basis of high-quality results, and comprehensive cost-effectiveness studies. The recognition of the need for increased global attention towards HepA prevention is an important outcome of this meeting.

For the first time a global meeting on hepatitis A virus (HAV) infection as vaccine preventable disease was organized at the end of 2007. More than 200 experts from 46 countries gathered to investigate the changing global HAV epidemiology reflecting the increasing numbers of persons at risk for severe clinical disease and mortality from HAV infection. The benefits of childhood and adult hepatitis A (HepA) vaccination strategies and the data needed by individual countries and international health organizations to assess current HepA prevention strategies were discussed. New approaches in preventing HAV infection including universal HepA vaccination were considered. This introductory paper summarizes the major findings of the meeting and describes the changing epidemiology of HAV infections and the impact of HepA vaccination strategies in various countries. Implementation of HepA vaccination strategies should take into account the level of endemicity, the level of the socio-economic development and sanitation, and the risk of outbreaks. A stepwise strategy for introduction of HepA universal immunisation of children was recommended. This strategy should be based on accurate surveillance of cases and qualitative documentation of outbreaks and their control, secure political support on the basis of high-quality results, and comprehensive cost-effectiveness studies. The recognition of the need for increased global attention towards HepA prevention is an important outcome of this meeting.


The Viral Hepatitis Prevention Board jointly organized with the European Union for School and University Health and Medicine a meeting on the prevention and control of viral hepatitis through adolescent health programmes in Europe, held in Ljubljana, Slovenia, 15-16 March 2007. Participants from some 16 countries in Europe as well as the United States of America emphasized the importance of reaching adolescents mainly through school health programmes, provided an overview of currently existing youth health systems and reviewed their experiences with childhood and adolescent immunization programmes. The meeting concluded with a discussion of issues, lessons learnt, opportunities and action points for the future.
disease for hepatitis A show a wide diversity among the participating countries. The introduction of a standardised system of data collection at the European Union level according to ICD-10 but respecting the local current practices is a primary need, especially for data that should be collected in all countries, like hospitalisation and mortality. A link to surveillance databases is also strongly recommended.


The long-term efficacy of hepatitis B vaccine, long-term effectiveness of hepatitis B immunisation programmes, immune memory induced by hepatitis B vaccine, current booster policies, and impact of hepatitis B virus mutants on immunisation programmes were reviewed at the Viral Hepatitis Prevention Board (VHPB) meeting in Seville, Spain, March 2004. The main focus was on universal vaccination programmes with data being presented from Italy, Saudi Arabia, Singapore, Spain, Taiwan, Thailand, The Gambia, and USA (Alaska).


The Viral Hepatitis Prevention Board (VHPB) convened a meeting of international experts from the public and private sectors in the Nordic countries and Germany, in order to review the epidemiological situation, the surveillance systems for infectious diseases, the immunization programmes and policy, and the monitoring of adverse events after hepatitis vaccination in those countries, to evaluate prevention and control measures, and to identify the issues that arose and the lessons learnt. Considerable progress has been made in the past decades in the prevention and control of viral hepatitis in the respective countries. Vaccination programmes have been set up, blood products' safety has significantly been improved, and outbreak investigations remain the basis for the implementation of control measures. However, additional work remains to be done. Awareness of viral hepatitis among the public and professionals should further be raised, and more political support is needed regarding the value of prevention efforts and vaccination programmes.


The overall situation on viral hepatitis prevention and control in Italy was reviewed and evaluated at a Viral Hepatitis Prevention Board (VHPB) meeting in Catania, Sicily, on 7-8 November 2002. Several specific conclusions, drawn from the presentations and discussions, were considered to constitute an example of how to handle these issues in other European and industrialized countries.
PART II. Hepatitis in Latin America


In efforts to inform public health decision makers, the Global Burden of Diseases, Injuries, and Risk Factors 2010 (GBD2010) Study aims to estimate the burden of disease using available parameters. This study was conducted to collect and analyze available prevalence data to be used for estimating the hepatitis C virus (HCV) burden of disease. In this systematic review, antibody to HCV (anti-HCV) seroprevalence data from 232 articles were pooled to estimate age-specific seroprevalence curves in 1990 and 2005, and to produce age-standardized prevalence estimates for each of 21 GBD regions using a model-based meta-analysis. This review finds that globally the prevalence and number of people with anti-HCV has increased from 2.3% (95% uncertainty interval [UI]: 2.1%-2.5%) to 2.8% (95% UI: 2.6%-3.1%) and >122 million to >185 million between 1990 and 2005. Central and East Asia and North Africa/Middle East are estimated to have high prevalence (>3.5%); South and Southeast Asia, sub-Saharan Africa, Andean, Central, and Southern Latin America, Caribbean, Oceania, Australasia, and Central, Eastern, and Western Europe have moderate prevalence (1.5%-3.5%); whereas Asia Pacific, Tropical Latin America, and North America have low prevalence (<1.5%). Conclusion: The high prevalence of global HCV infection necessitated renewed efforts in primary prevention, including vaccine development, as well as new approaches to secondary and tertiary prevention to reduce the burden of chronic liver disease and to improve survival for those who already have evidence of liver disease.


Data reported during recent years reveal the complex picture of the epidemiology of hepatitis E virus (HEV) infection in Latin America. Whereas in countries like Argentina and Brazil is almost identical to the characteristic of most countries from North America and Europe, HEV in the Caribbean and Mexico involves the water-borne, non-zoonotic viral genotypes responsible for epidemics in Asia and Africa. Nevertheless, Latin America has been considered a highly endemic region for hepatitis E in the scientific literature, a generalization that ignores the above complexity. In addition, reports from isolated Amerindian communities, which display well known, important and very specific epidemiological features for hepatitis B and D virus infections are neither taken into account when considering the epidemiology of hepatitis E in the region. This review updates compilation of the available information for the HEV infection, both among humans and other mammals, in Latin America, discusses the strengths and the weaknesses of our current knowledge, and identifies future areas of research.


Viral hepatitis B, C and delta still remain a serious problem in Latin America. Data from the 1980s indicated that HBV and HDV infection are the main causes of chronic hepatitis. However, the spread of HBV infection could be controlled through the implementation of immunization programmes. Different countries from Mexico to Argentina display marked differences in terms of HBV genotype distribution. HBV genotype F has been identified as the most frequent in most Latin America countries, except for Mexico and Brazil, where genotypes H and A are the most frequent, respectively. In Latin America, the overall prevalence of HCV antibody is estimated to be 1.5%. Latin American countries have been very proactive in screening their blood supplies, thus minimizing risk of HCV transmission through transfusion. The number of diagnosed and treated patients is still low, thereby increasing the burden of complications such as liver cirrhosis or hepatocellular carcinoma. The most prevalent HCV genotype is 1, which is the genotype with the greatest worldwide spread, but it is a different genotype from other regions like Africa and Asia. HDV is present worldwide but its distribution pattern is not uniform. HDV was recently detected in novel geographic regions, reinforcing that it is a very serious health threat in under-developed countries. The main prevalence areas are the Mediterranean basin, the Middle East, central and northern Asia, western and central Africa, the Amazonian basin (Brazil, Peru, Venezuela and Colombia) and the Pacific islands.

Novel strategies to increase HBV immunization in the Latin American population are needed to warrant thorough coverage in the rural areas.
Hepatitis C infection is a global burden disease. Its relationship to chronic hepatitis, cirrhosis and hepatocellular carcinoma has been demonstrated, and at the current moment in USA and Europe is one of the major causes for liver transplantation. In Latin America, seroprevalence for HCV is between 1-2%. Risk groups are well-known: persons that have received blood products, drug addicts, health-workers, sexual workers, convicts, those with tattoo or piercing, as well as newborns from women positive for HCV. Genotype 1 is the more prevalent (> 80%) in Latin American countries have been very proactive in screening their blood supplies, thus minimizing the risk of transmission through transfusion. This suggests that other risk factors are set to play a major role in continued new infections. The number of diagnosed and treated patients is low, thereby increasing the burden of complications such as liver cirrhosis or hepatocellular carcinoma. The HCV prevalence, according to our modelling progressions, considering the patterns of severity of liver diseases in various populations. Furthermore, global human migrations affect the pattern of genotype distribution, introducing genotypes differing from those found in the original inhabitants.

Approximately 2 billion people worldwide are infected with HBV, and 350 million people are chronic carriers. HBV is classified into nine genotypes (A to I). Genotype F is the most prevalent in the Spanish-speaking countries and in the Amerindian population in South America. HBV genotype F was primarily found in indigenous populations from South America and is divided into four subgenotypes (F1 to F4). Subgenotype F1 is further divided into F1a (found in Costa Rica and El Salvador) and F1b (found in in Alaska, Argentina and Chile). Subgenotypes F2 and F3 cocirculate in the north of South America: F2a is found in Brazil and Venezuela, F2b is described only in Venezuela, F3 is frequent in Colombia, Venezuela and Panama, and F4 is reported from the central and south areas of South America, including Bolivia, Argentina and southern Brazil. HBV genotypes and subgenotypes have distinct geographical distributions. It is currently under discussion whether they are associated with different prognoses, considering the patterns of severity of liver diseases in various populations. Furthermore, global human migrations affect the pattern of genotype distribution, introducing genotypes differing from those found in the original inhabitants.

Chronic infection with hepatitis C virus (HCV) is a major and growing public health concern worldwide, including in Latin America. With more efficacious therapies becoming available, decision-makers will require accurate estimates of disease prevalence to assess the potential impact of new treatments. However, few estimates of the epidemiologic burden, either overall or by country, are available for Latin America; and the potential impact of currently-available treatments on the epidemiologic burden of HCV in Latin America has not been assessed. To address this, we systematically reviewed twenty-five articles presenting population-based estimates of HCV prevalence from general population or blood donor samples, and supplemented those with publically-available data, to estimate the total number of persons infected with HCV in Latin America at 7.8 million (2010). Of these, over 4.6 million would be expected to have genotype 1 chronic HCV, based on published data on the risk of progression to chronic disease and the HCV genotype distribution of Latin America. Finally, we calculated that between 1.6 and 2.3 million persons with genotype 1 chronic HCV would potentially benefit from current treatments, based on published estimates of genotype-specific treatment responsiveness. In conclusion, these estimates demonstrate the substantial present epidemiologic burden of HCV, and quantify the impending societal and clinical burden from untreated HCV in Latin America.


BACKGROUND AND AIM: The purpose of the present investigation is to provide an analysis of previous works on the epidemiology of the hepatitis C virus (HCV) infection from six countries throughout Latin America, to forecast the future HCV prevalence trends in Argentina, Brazil, Mexico and Puerto Rico, and to outline deficiencies in available data, highlighting the need for further research. METHODS: Data references were identified through indexed journals and non-indexed sources. Overall, 1080 articles were reviewed and 150 were selected based on their relevance to this work. When multiple data sources were available for a key assumption, a systematic process using multi-objective decision analysis (MODA) was used to select the most appropriate sources. When data were missing, analogues were used. Data from other countries with similar risk factors and/or population compositions were used as a proxy to help predict the future trends in prevalence. RESULTS: The review indicates that the dominant genotype is type 1. HCV prevalence in the analysed countries ranges from 1 to 2.3%. The Latin American countries have been very proactive in screening their blood supplies, thus minimizing the risk of transmission through transfusion. This suggests that other risk factors are set to play a major role in continued new infections. The number of diagnosed and treated patients is low, thereby increasing the burden of complications such as liver cirrhosis or hepatocellular carcinoma. The HCV prevalence, according to our modelling is steady or increasing and the number of infected individuals will increase. CONCLUSIONS: The results herein reported should provide a foundation for informed planning efforts to tackle hepatitis.


Hepatitis C infection is a global burden disease. Its relationship to chronic hepatitis, cirrhosis and hepatocellular carcinoma has been demonstrated, and at the current moment in USA and Europe is one of the major causes for liver transplantation. In Latin America, seroprevalence for HCV is between 1-2%. Risk groups are well-known: persons that have received blood products, drug addicts, health-workers, sexual workers, convicts, those with tattoo or piercing, as well as newborns from women positive for HCV. Genotype 1 is the more prevalent (> 80%) in Latinamerica, although genotypes 2, 3 and 4 have been found. In Peru, prevalence is low, around 1%, being
found more frequently in the jungle region. Risk groups demonstrated in Peru are persons that received transfusion, patients in hemodyalisis, health-workers (in special those that work with blood products), and drugaddicts especially those with cocaine aspiration. Genotype 1 is the more prevalent, although few studies have been done. It is urgent to do more epidemiological studies related to this infection to know the real situation of this disease and its consequences in order to establish better health strategies.

Delay in diagnosis of chronic hepatitis due to HCV or HBV is mainly caused by lack of information about these prevalent and life-threatening disorders. Diagnostic tests are either not easily available or not requested by primary care physicians. When cases positive for hepatitis-B markers or anti-HCV are found, misleading guidance may be given to patients. Absence of symptoms associated with lack of information is another barrier to the care of chronic hepatitis patients. Management of these diseases is not simple, and treatment options and schedules are in rapid and continuous evolution. Surveillance of patients with chronic hepatitis before, during and after antiviral therapy is mandatory. For patients with no indication for therapy, identification of optimal follow-up frequency constitutes a problem, as does determination of the correct amount and type of diagnostic tests to be used. Another important barrier to care of patients with chronic hepatitis is the absence of an ideal drug, namely, one that is inexpensive, does not have collateral effects, and has very high percentages of cure or resolution. Access to therapy is uncertain, and the side effects of interferon frighten some patients and physicians. Lack of adherence to the medication, early interruption, and the need for other supportive therapies are frequent barriers to successful treatment.

Hepatitis B virus (HBV) infection is still a significant health concern in Latin America, where around 11 million persons are infected. Amerindian populations exhibit the highest prevalences of infection in the region. HBV exhibits a degree of variability intermediate between DNA and RNA viruses. This plasticity leads to the generation of several mutants and genotypic variability. Eight HBV genotypes (A-H) have been described, based on a minimum divergence of 8% of the complete genome sequences. HBV genotype F is the most divergent of the HBV genotypes, is autochthonous to South America and is highly predominant in the Northern region of South America. The recently described HBV genotype H is closely related to genotype F and seems to be restricted to Central and North America. Recombination among different HBV strains seems to be frequent, although it has not been described yet between American genotypes. Inside HBV genotype F, four subgenotypes have been described, which exhibit a geographic pattern of distribution. The clinical and biologic importance of the genotypic diversity of HBV is of major concern at the present moment and has been studied in Asia and Europe. In contrast, it is not known whether infection with the American HBV genotypes F and H is associated with a rapid or slow development of disease. The origin of HBV is still an open question. Depending on the model used for the phylogenetic analysis, an Asian or an American origin of HBV has been proposed. By revisiting the genotypic diversity of HBV, an alternative explanation is that human HBV genotypes might have emerged by several zoonotic introductions, both in the Old and the New World.

Hepatitis B and C virus infections constitute a significant health problem in Latin America. Approximately 400,000 new cases of hepatitis B per year and 10 million people infected with hepatitis C are estimated to occur. HBV and HCV genotypic distribution data from Asia and Europe in the Caribbean and in South and Central America. Hepatitis B and C epidemiology needs to be considered in the context of dissimilar social and economic aspects among the countries of the region. Behaviors, cultural and ethical aspects, as well as environmental and organizational processes affect directly the way these diseases are approached in their diagnosis, treatment and prevention.

BACKGROUND: This prospective, multicenter study examined the importance of hepatitis viruses as etiological agents of acute liver failure (ALF) and the outcome of ALF cases in Latin American children and adolescents.
METHODS: The study was conducted for minimum 12 months in 9 centers in Argentina, Brazil, Chile, Colombia, Costa Rica, and Mexico during 2001-2002. Hospitalized patients aged 1-20 years with a suspected diagnosis of ALF were included in the study and tested for serologic markers for hepatitis A, B, and C viruses.
RESULTS: Of the 106 patients enrolled, 88 were included in the analysis. Median age was 5 years, and 55% with ALF were aged 1-5 years. A total of 37 individuals (43%) tested positive for anti-hepatitis A virus (HAV) immunoglobulin M (IgM) as marker of acute HAV infection; one was positive for anti-hepatitis B core antigen IgM and negative for hepatitis B surface antigen. None had markers of hepatitis C virus infection. Mortality rates in the overall study cohort (45%) and for those who tested anti-HAV IgM positive (41%) were similar. Forty-one percent of all patients and 46% of those positive for anti-HAV IgM underwent transplantation. The mortality rate in those with liver transplantation
was half of that in patients who were not transplanted (28% versus 57%). CONCLUSIONS: HAV was the main etiologic agent of ALF in the population studied.


An oral, human-derived monovalent (G1P1A) rotavirus vaccine, strain RIX4414, has been developed by GlaxoSmithKline, Rixensart, Belgium. The safety, immunogenicity and efficacy of this vaccine were evaluated in a randomized, double-blind, placebo-controlled, phase Ib trial conducted in Brazil, Mexico and Venezuela. Healthy infants were given two doses of vaccine (104.7, 105.2 or 105.8 ffu) or placebo at age 2 and 4 months, with routine DTPw-HBV and Hib vaccines. OPV was given separately, at least 2 weeks before or after administration of the study vaccine. A total of 2155 infants were enrolled, of whom 1618 received one of the three vaccine viral concentrations and 537 were given placebo. Analysis of efficacy included diarrheal episodes occurring from 2 weeks after second dose until one year of age. Efficacy rates against any rotavirus gastroenteritis, severe rotavirus gastroenteritis and hospitalizations for rotavirus disease were as high as 70% (46-84%; 95%CI), 86% (63-96%; 95%CI), and 93% (54-100%; 95%CI), respectively. For non-G1 (mainly G9) serotypes, RIX4414 vaccine conferred protection as high as 83% (40-97%; 95%CI) against severe gastroenteritis. A decrease was noted in the incidence of severe rotavirus-related gastroenteritis after first dose. It is demonstrated that two doses of RIX4414 are highly efficacious against severe rotavirus gastroenteritis and hospitalization, including disease caused by non-G1 strains, namely G9 serotypes.


Hepatitis B is a serious public health problem leading to chronic infection, liver cirrhosis, and hepatocellular carcinoma. The World Health Organization (WHO) and the Pan American Health Organization (PAHO) recommend routine universal infant vaccination against hepatitis B as the main strategy for the control hepatitis B and its severe consequences. PAHO additionally recommends routinely vaccinating healthcare workers. As of 2005, all countries in the Americas, except Haiti and Dominica, have hepatitis B vaccine in their childhood immunization schedule; 13 countries/territories include a hepatitis B dose given at birth. Hepatitis B vaccine has been incorporated into national schedules using different modalities; notably, 28 countries use it as a combination vaccine diphtheria tetanus pertussis + Haemophilus influenzae type b + hepatitis B (DTP+Hib+Hep B) for infants. Coverage levels for the third dose of hepatitis B are usually over 80%; however, hepatitis B vaccine coverage overall is lower than for the third dose of DTP. Insufficient information is available at this time to assess the use of hepatitis B vaccine in healthcare workers in the Americas. The most important factor associated with the success in the implementation of hepatitis B vaccination has been the strong commitment of country governments. This experience can be used as a model when implementing new technologies in health as they become available. However, much still needs to be done to improve hepatitis B coverage.


In Latin America, despite the paucity of population studies, hepatitis B is considered endemic. The western Amazon is a highly endemic area where hepatitis D is also prevalent. In this area, outbreaks of fulminant hepatitis due to H13V and HDV are frequently reported. Non-safe sexual activity seems to be the most important transmission route, but intrafamilial transmission, during early childhood, is extremely significant in Amazonia. The H13V genotype distribution is heterogeneous with a high prevalence of genotype F in the Amazonian region and genotype A in all other areas. In the region where Asian and Italian immigration occurred, genotypes B, C and D are also described.


Hepatitis C virus (HCV) has been the subject of intense research and clinical investigations, as a consequence of the recognition of its major role in human disease. HCV evolution is a highly dynamic process. HCV exploits all known mechanisms of genetic variation, such as recombination and mutation, to ensure its survival. Like most RNA viruses, HCV circulates in vivo as a complex population of different but closely related variants, commonly referred to as a quasi species. This work describes the genetic variability of HCV in Latin America, with special emphasis on its diversification and recombination in this area of the world, and discusses how our knowledge of these issues can contribute to its control.


Hepatitis B virus (HBV) is an etiological agent of acute and chronic liver disease existing throughout the world. The high genetic variability of HBV is reflected by eight genotypes (A to H), each one with a particular geographical
prevalence. The global pattern of HBV genotypes is associated with the distribution of human populations among the different continents and may reflect the patterns of human migrations. Genotypes F and H are considered indigenous to Latin America. The most prevalent genetic group of Central and South America, genotype F, is subdivided into two subtypes and five clusters associated with defined geographic areas. Genotype H has been described in Mexico and Central America. This pattern provides a tool to reconstruct the initial immigration of ancestral Amerindians from Asia and their further spread through Central and South America. Other HBV genotypes found in different Latin American countries may reflect migration from other geographical areas into the region. Genotypes A and D are the signature of the European colonization that started in the sixteenth century, including slave trade from Africa. Genotypes B and C indicate the arrival of people from Southeast Asia. The impact of HBV genotypes on the natural course of HBV infection and response to treatment has been studied recently and controversial results have been obtained. The majority of the current information concerns with genotypes B and C. In contrast, very few data are available on the Latin American HBV genotypes F and H. It has been reported that liver failure and death may be more frequent in patients infected with genotype F. More studies are needed to assess the association between H13V genotypes and clinical course of infection, especially in Latin America.

2.1 Hepatitis in Argentina

Pubmed MEDLINE search on on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Argentina) NOT autoimmune} in all fields, filter (REVIEW and since 5year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Argentina were selected. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.


BACKGROUND: Hepatitis A virus (HAV) has shown intermediate endemicity in Argentina, but notification of clinical cases has decreased since the introduction of the vaccine in 2005. OBJECTIVES: In order to get insight into the local circulation of this virus after four years of the official introduction of the vaccine, the aims of this study were to provide information on HAV immune status of the adult population of Cordoba city and to conduct environmental surveillance of HAV in sewage and river samples in the same region. STUDY DESIGN: The prevalence of anti-HAV was determined by EIA in 416 samples of people (without prior vaccination) from Cordoba city (2009-2010). Spline regression models were estimated under generalized additive models. Environmental surveillance was conducted in river and sewage samples collected in the same period. Viral detection was performed by RT-Nested PCR of the 5’UTR. RESULTS: In Cordoba, the global prevalence of anti-HAV was 73.5%. It increased with age (p<0.0001) and it was associated with the low-income population (OR: 1.14; 95% CI 1.05-1.25). This prevalence decreased in younger age groups, especially in the high-income population. Environmental monitoring revealed the presence of HAV (IA) in 20.8% and 16.1% of wastewater and river samples, respectively. CONCLUSIONS: As a consequence of a decrease in HAV circulation due to improvements in immunization, socio-economic and hygienic conditions, young adults are becoming increasingly susceptible to HAV infections. Environmental monitoring demonstrated that HAV circulates in the local population; therefore, health care systems should consider the implementation of preventive measures for susceptible adults in order to reduce the risk of HAV infection.


BACKGROUND: After a country wide outbreak occurred during 2003-2004, 1 dose of hepatitis A vaccine was introduced into Argentinian regular immunization schedule for all children aged 12 months in June 2005. The aim of this study was to assess the impact of this novel intervention. METHODS: A longitudinal analysis was done of hepatitis A virus (HAV) infection rates reported to the National Epidemiological Surveillance System from 2000 to
The aim of this work was to describe the current molecular epidemiology and genetic diversity of HBV in Mar del Plata, an important Argentinean touristic city. The phylogenetic analysis of 29 HBV DNA positive serum samples performed in selected populations of blood donors or vulnerable groups. The latter values are in keeping with the observed. Our data contrasted with previous studies that reported rates ranging from 1.5% to 2.5%, mainly performed in selected populations of blood donors or vulnerable groups. The latter values are in keeping with the prevalence reported by the 2007 Argentinian HCV Consensus (approximately 2%). HCV subtypes were distributed per province. The NS5B polymerase region, encompassing nt 8262-8610, was used for initial genotype classification. The 5' untranslated region (5'UTR) was used for RNA detection and subtyping. RESULTS: An unexpectedly low prevalence of HCV infection in the general population (0.32%) was observed. Our data contrasted with previous studies that reported rates ranging from 1.5% to 2.5%, mainly performed in selected populations of blood donors or vulnerable groups. The latter values are in keeping with the prevalence reported by the 2007 Argentinian HCV Consensus (approximately 2%). HCV subtypes were distributed as follows: 1a (25%), 1b (25%), 2c (25%), 3a (5%), and 2j (5%). Two isolates ascribed either to genotype 1 (5%) or to genotype 3 (5%) by 5'UTR phylogenetic analysis could not be subtyped. Subtype 1a sequences comprised a highly homogeneous population and clustered with United States sequences. Genotype 1b sequences represented a heterogeneous population, suggesting that this genotype might have been introduced from different sources. Most subtype 2c sequences clustered close to the 2c reported from Italy and Southern France. CONCLUSION: HCV has a low prevalence of 0.32% in the studied general population of Argentina. The pattern of HCV introduction and transmission in Argentina appears to be a consequence of multiple events and different for each subtype.


AIM: To study the subtype prevalence and the phylogenetic relatedness of hepatitis C virus (HCV) sequences obtained from the Argentine general population, a large cohort of individuals was analyzed. METHODS: Healthy Argentinian volunteers (n = 6251) from 12 provinces representing all geographical regions of the country were studied. All parents or legal guardians of individuals younger than 18 years provided informed written consent for participation. The corresponding written permission from all municipal authorities was obtained from each city or town where subjects were to be included. HCV RNA reverse transcription-polymerase chain reaction products were sequenced and phylogenetically analyzed. The 5' un translated region (5'UTR) was used for RNA detection and initial genotype classification. The NS5B polymerase region, encompassing nt 8262-8610, was used for subtyping. RESULTS: An unexpectedly low prevalence of HCV infection in the general population (0.32%) was observed. Our data contrasted with previous studies that reported rates ranging from 1.5% to 2.5%, mainly performed in selected populations of blood donors or vulnerable groups. The latter values are in keeping with the prevalence reported by the 2007 Argentinian HCV Consensus (approximately 2%). HCV subtypes were distributed as follows: 1a (25%), 1b (25%), 2c (25%), 3a (5%), and 2j (5%). Two isolates ascribed either to genotype 1 (5%) or to genotype 3 (5%) by 5'UTR phylogenetic analysis could not be subtyped. Subtype 1a sequences comprised a highly homogeneous population and clustered with United States sequences. Genotype 1b sequences represented a heterogeneous population, suggesting that this genotype might have been introduced from different sources. Most subtype 2c sequences clustered close to the 2c reported from Italy and Southern France. CONCLUSION: HCV has a low prevalence of 0.32% in the studied general population of Argentina. The pattern of HCV introduction and transmission in Argentina appears to be a consequence of multiple events and different for each subtype.


The aim of this work was to describe the current molecular epidemiology and genetic diversity of HBV in Mar del Plata, an important Argentinean touristic city. The phylogenetic analysis of 29 HBV DNA positive serum samples showed that F1b was the predominant subgenotype (sgt, 62.1%), followed by sgt A2 (13.8%) and sgt F4, gt D and gt G (6.9% each). Among anti-HBc IgM positive samples, 75.0% were sgt F1b, followed by sgt F4 (12.5%), sgt A2 (6.25%) and sgt D (6.25%). Three recombinant full length genomes were found: two G/F1b (some of the first gt G detected in Argentina) and one F4/D2. The circulation of clinical important mutations in the city was described.
Mutations at the HBsAg were detected in 34.5% of the analyzed samples, associated with laboratory diagnosis and antiviral treatment failures, immune escape and hepatocellular carcinoma. Most of the samples presented wild type BCP/PC sequences. Coalescence analysis for the most prevalent sgt F1b estimated that the diversification mainly occurred during mid '90s and the TMRCA was estimated in 1987. Finally, the high presence of the autochthonous sgt F1b, associated with the anti-HBc IgM positive infection and its present-day diversification process, shows the strong impact of internal human migratory movements into the current population of Mar del Plata.


Liver transplantation success is limited by the availability of donors. To overcome this limitation, anti-core-positive donors are increasingly being accepted, but underutilization of this resource still occurs. We performed the current study to determine the prevalence of anti-core-positive donors in our region and to describe the management of these donors and their recipients. Between January 2005 and July 2011, the national transplant database included 2,262 registered liver donors among whom 106 (4.7%) were anti-core-positive including 59 (56%) discarded and 47 (44%) implanted organs. A median of 14.5 offers (range 4-60) were rejected before harvesting and implanting the accepted grafts. The only difference between the implanted and the discarded grafts was found for the alanine aminotransferase level, which was higher among the discarded ones (50 +/- 59 U/L vs 25 +/- 16, P < .05). Among 40 recipients included in the study, 5 (12.5%) did not receive any prophylaxis; 18 (45%) a nucleos(t)ide analog 11 (25.5%), hepatitis B immunoglobulin and nucleos(t)ide analogs and 6 (15%) pretransplant hepatitis B vaccination. Over a mean follow-up of 871 +/- 585 days, 4 de novo hepatitis B cases were identified at 545, 720, 748, and 1,080 days posttransplantation. None of these patients had received any prophylaxis. In all cases entecavir successfully controlled viral replication. We believe that better utilization of these donors and careful management of their recipients represent safe strategies to expand the liver donor pool in Argentina.


In Argentina, the four strategies of epidemiological surveillance from the National System of Health Surveillance (SNVS) are Diseases of Mandatory Report (C2), Sentinel Units (SU), Laboratory Surveillance (SIVILA) and National Programs (National Plan of Blood, information from blood banks). They collect information about viral hepatitis (VH). The objective of this work was to analyze the information recorded by the SUs of VH for hepatitis B and C in the period between January 1th 2007 and December 31h 2010. In this period, out of the 1,769 cases recorded (entered by 21 of 24 SUs), 806 entries were hepatitis B, 848 hepatitis C and 115 belonged to other definitions. The relative proportions between hepatitis B and hepatitis C were heterogeneous between the SUs. The age distribution was homogeneous, being the predominant group in acute hepatitis B the 25- to 34-year-old group. In hepatitis C, the age distribution was broader. The distribution by sex and risk factors was heterogeneous between the different SUs. In hepatitis C, genotype 1 was the predominant one. In conclusion, the information provided by the SUs contributes as an evidence of the public health problem posed by this pathology in our country.


Several studies have demonstrated that viral load is a key factor to determine the development of HBV infection and to assess treatment options for the disease. There is a lack of studies analyzing viral load levels in chronic hepatitis B patients in Argentina and the epidemiologic information is limited. The aim of this study was to determine viral load levels and its distribution in patients diagnosed with chronic hepatitis B from geographical areas with high prevalence for HBV in Argentina. Fifty-one per cent of the study population had HBV DNA levels > or = 10(4) copies/ml and a median viral load of 11,910 copies/ml. The viral load was significantly higher in HBeAg seropositive patients compared with those seronegative for HBeAg (P < 0.05). Salta and Entre Rios provinces showed low viral loads, while Chaco, Misiones and Formosa provinces had a median viral load ranging between 10(4) and 10(5) copies/ ml. This is the first study providing detailed information on viral load in chronic hepatitis B patients from Argentina. Availability of viral load levels in chronic hepatitis B enables evaluation of implementation of actions to analyze follow-up and/or treatment options for preventing disease complications, improving health care and diminishing the potential burden on the health care system.


The present study reports the effectiveness of the association of a single dose of hepatitis B immunoglobulin (HBlg) associated to entecavir in the prophylaxis of hepatitis B in patients who have undergone liver transplantation. Six patients that had been transplanted because of hepatitis B liver disease were retrospectively
evaluated. Three of them developed non-oncological complications related to liver cirrhosis, two had hepatocellular carcinoma and another one had fulminating HBV hepatitis. The mean follow-up was 22 months (range: 7-52 months). The 6 patients received entecavir as prophylactic treatment before transplantation. The pretransplant viral load was undetectable in all patients. HBsAg seroconversion was observed in four of the six patients. Three patients died during follow-up, two because of recurrent hepatocellular carcinoma, none of them had detectable HBV serum viral load. In a small series of patients we could demonstrate that a regimen with a single dose of gamma globulin entecavir is effective in the post-transplant management of patients with liver disease associated with HBV. Future studies will be able to demonstrate the effectiveness of specific gamma globulin-free regimens.


BACKGROUND: The purpose of this study was to update the epidemiological data on the prevalence of coinfection with hepatitis C virus (HCV) and HIV, and to identify whether specific clinical and epidemiological factors influenced the response of HIV-positive adults to highly active antiretroviral therapy (HAART). METHODS: This retrospective observational cohort study of 238 HIV-infected patients evaluated the effect of different epidemiological and clinical parameters (including HCV coinfection) on therapy response among HIV-infected adults initiating HAART. Multiple logistic regression models were used to identify factors associated with therapy response and estimated risk coefficients. RESULTS: Seroprevalence of HCV infection in this population was 26% (62/238). We did not observe a significant association between immunological or virological response relating to patient gender or HAART regimen. However, this analysis showed that HCV serological status, age at HIV diagnosis, duration of treatment and WHO clinical stage of AIDS (<200 CD4 cells/ml independently of viral load either < or > to 100,000 copies/ml), were significantly associated with immunological and virological responses to HAART. CONCLUSIONS: These results show further evidence that hepatitis C serostatus is associated with a reduced response to HAART.


In Argentina, current procedures to ensure the safety of the blood supply for transfusion include the serologic detection of specific blood-borne infections. The aim of this study was to evaluate the prevalence and the genetic diversity of hepatitis B virus (HBV) and hepatitis D virus (HDV) in blood donor populations from two distantly located Argentine regions. Data from 56,983 blood donations from the Favaloro Foundation, in the city of Buenos Aires (Central Region), and the Central Blood Bank of Misiones Province (Northeast Region) were analyzed. Samples that were reactive for HBsAg were analyzed for HBV-DNA characterization and HDV serological and molecular analysis. The HBV prevalence was 0.12 % for HBsAg and 1.68 % for anti-HBc antibodies in Buenos Aires, and 0.73 % and 8.55 %, respectively, in Misiones. Seventy-seven HBsAg-reactive samples were analyzed by polymerase chain reaction for HBV-DNA. Subgenotypes A2, B2, C2, F1b and F4 (Buenos Aires) and F1b and D3 (Misiones) were detected. Several mutations within the major hydrophilic region of HBsAg, the reverse transcriptase, the basal core promoter, and the precore/core were detected. HDV genotype 1 was identified in Buenos Aires. This study confirms the circulation of several HBV subgenotypes, as well as known and newly identified variants, and the presence of HDV1 in this population. A thorough investigation has to be carried out to evaluate the clinical importance of some of the documented mutations as well as those detected in the HDV1 case.


OBJECTIVE: The aims of this study were to investigate the frequency of male circumcision among men who have sex with men (MSM) in Buenos Aires, Argentina; the association between circumcision and sexually transmitted infections (STIs); and, among those uncircumcised, the willingness to be circumcised. METHODS: A cross-sectional study was conducted among 500 MSM recruited through the respondent-driven sampling (RDS) technique. Participants underwent a consent process, responded to a Web-based survey that included questions on demographic information, sexual behaviour, and circumcision and provided biological samples. HIV, hepatitis B virus (HBV), hepatitis C virus (CV), Treponema pallidum, and human papilloma virus (HPV) diagnoses were performed using standard methodologies. For all analyses, data were weighted based on participants' network size. RESULTS: Only 64 (13%) of the 500 MSM in our study reported being circumcised. Among uncircumcised men (n=418), 302 (70.4%) said that they would not be willing to get circumcised even if the procedure could reduce the risk of HIV infection. When considering all participants, circumcision status was not significantly associated with HIV, HBV, HCV, T. pallidum or HPV infections. However, when we restricted the sample to men who do not practice receptive anal intercourse (RAI) and compared circumcised to uncircumcised men, the former (N=33) had no cases of HIV infection, while 34 of 231 (14.8%) uncircumcised men were HIV positive (p=0.020). Regarding
HPV, uncircumcised men had a significantly larger number of different HPV types compared with circumcised men (mean 1.83 vs. 1.09, p<0.001) and a higher frequency of high-risk-HPV genotypes (47.6% vs. 12.5%, p=0.012).

CONCLUSIONS: Consistent with international evidence, male circumcision appears to have a partial protective effect among MSM. The efficacy of circumcision in reducing risk of HIV infection among MSM appears to be correlated with sexual practices. Given the lack of motivation among MSM with regard to circumcision, proper awareness on the risks and benefits of circumcision needs to be created, if circumcision has to be introduced as a prevention strategy.


BACKGROUND: The estimated prevalence of HCV infection in Argentina is around 2%. However, higher rates of infection have been described in population studies of small urban and rural communities. The aim of this work was to compare the origin and diversification of HCV-1b in samples from two different epidemiological scenarios: Buenos Aires, a large cosmopolitan city, and O`Brien, a small rural town with a high prevalence of HCV infection.

PATIENTS AND METHODS: The E1/E2 and NS5B regions of the viral genome from 83 patients infected with HCV-1b were sequenced. Phylogenetic analysis and Bayesian Coalescent methods were used to study the origin and diversification of HCV-1b in both patient populations. RESULTS: Samples from Buenos Aires showed a polyphyletic behavior with a tMRCA around 1887-1900 and a time of spread of infection approximately 60 years ago. In contrast, samples from OBrien showed a monophyletic behavior with a tMRCA around 1950-1960 and a time of spread of infection more recent than in Buenos Aires, around 20-30 years ago. CONCLUSION: Phylogenetic and coalescence analysis revealed a different behavior in the epidemiological histories of Buenos Aires and OBrien. HCV infection in Buenos Aires shows a polyphyletic behavior and an exponential growth in two phases, whereas that in OBrien shows a monophyletic cluster and an exponential growth in one single step with a more recent tMRCA. The polyphyletic origin and the probability of encountering susceptible individuals in a large cosmopolitan city like Buenos Aires are in agreement with a longer period of expansion. In contrast, in less populated areas such as OBrien, the chances of HCV transmission are strongly restricted. Furthermore, the monophyletic character and the most recent time of emergence suggest that different HCV-1b ancestors (variants) that were in expansion in Buenos Aires had the opportunity to colonize and expand in OBrien.


Prevalence rates of hepatocellular carcinoma (HCC)-associated hepatitis B virus (HBV) pre-S mutants among most genotypes are still lacking. In this study, viral (sub)genotypes of 70 Argentine nucleotide sequences (33 newly obtained) were determined by phylogenetic analysis, and the presence of such mutants was assessed in the HBV/A2 sequences. Ten per cent of the HBV/A2 and 12.5% of the HBV/F1b - but none of HBV/F4 - exhibited a deletion in the pre-S1/pre-S2 region. The contribution of these variants to liver cirrhosis (LC) and/or HCC development among HBV/F and HBV/A isolates deserves further prospective clinical studies.


OBJECTIVE: To describe the prevalence of low serum Se and determine whether HIV, hepatitis C virus (HCV) and/or the types of drugs used are associated with serum Se in a cohort of infected and uninfect ed drug users.

DESIGN: Independent correlates of low serum Se levels based on data collected from food recalls, physical examinations and clinical questionnaires were identified using multivariate regression analysis. SETTING: Buenos Aires, Argentina SUBJECTS: A total of 205 (twenty-five female and 180 male) former and current drug users. RESULTS: Drug users had an average serum Se level of 69.8 (sd 32.8) mug/d, [corrected] and 82 % were considered deficient (<85 mug/l). [corrected] Multivariate analyses found that HIV- and/or HCV-infected individuals had lower mean Se compared with healthy, uninfect ed drug users (HIV/HCV co-infection: -25.3 mug/l (se 7.6), P = 0.001; HIV alone: -28.9 mug/l (se 6.9), P < 0.001; HCV alone: -19.4 mug/l (se 7.1), P = 0.006). Current and previous drug use was associated with higher serum Se. Cigarette smoking and heavy alcohol consumption were not found to be associated with Se status. CONCLUSIONS: Low serum Se levels are highly prevalent among drug users in Buenos Aires, Argentina. Se supplementation and/or dietary interventions may be warranted in drug users who are at high risk for HIV and/or HCV infection.


BACKGROUND: Hepatitis B virus infection is frequent among Amerindians. In Argentina HBV genotypes A, B, C, D, E, F and H were described in different populations, while some cases of occult hepatitis B infection (OBI) were...
Hepatitis A virus (HAV) has shown intermediate endemicity in Argentina, but its incidence has decreased since vaccine introduction in 2005. Environmental surveillance was conducted in five rivers from Argentina from 2005 to 2012, complementing clinical information. HAV detection decreased since 2005, although its circulation to 2012, complementing clinical information. HAV detection decreased since 2005, although its circulation


BACKGROUND: Guidelines suggest that all HBsAg-positive patients should be tested for anti-HDV IgG antibodies and to confirm active hepatitis D virus (HDV) infection by detection of HDV RNA by reverse transcriptase (RT) polymerase chain reaction (PCR). OBJECTIVES: The aim of this study was to determine the serological prevalence and molecular features of HDV within an Amerindian community from Argentina exhibiting positivity for HBsAg and/or anti-HBc total Ig. STUDY DESIGN: Forty-six plasma samples were tested for the detection of total anti-HDV antibodies by ELISA. Concomitantly, a partial RNA region coding for the delta antigen (HDag) was amplified by RT-nested PCR (RT-nPCR). In silica translation of DNA sequences into the amino acid (aa) sequence of HDag-S (aa110-195) and HDag-L (aa110-214) was performed. RESULTS: Out of 46 HDV non-reactive samples by ELISA, 3 were HDV RNA positive by RT-nPCR. These samples were anti-HBc-only positive, 2 of them identified as cases of occult hepatitis B infection (OBI). The 3 cases were HBeAg-negative and showed normal ALT/AST levels. All sequences were ascribed to HDV genotype 1, but exhibited nucleotide differences in HDag-L coding region, among which, mutations at codons 197 and 201 - reportedly known to promote in vitro an unsuitable interaction with HBsAg - were observed. CONCLUSIONS: These results provide evidence of covert HDV infection even among OBI, highlighting the need to reevaluate the currently applied guidelines for HDV diagnostic algorithms, as well as to explore if the observed mutations promote any effect on HDV pathogenesis.


OBJECTIVE: To assess antibody persistence after vaccination with a new, fully liquid, hexavalent DTaP-IPV-Hep B-PRP-T vaccine at 18 months of age versus licensed DTaP-IPV//PRP-T and hepatitis B (Hep B) vaccines, and to assess the immunogenicity and safety of a subsequent DTaP-IPV//PRP-T booster. METHODS: A phase III, open-label, single-center study was conducted. Infants previously primed with 3 doses of DTaP-IPV-Hep B-PRP-T (Hexaxim: N = 232 [group 1]) or DTaP-IPV//PRP-T and hepatitis B vaccine (Pentaxim + Engerix B Pediatrico: N = 226 [group 2]) at 2, 4, and 6 months of age received a DTaP-IPV//PRP-T booster at 18 months of age. Antibodies were measured before and 1 month after booster vaccination. Safety was evaluated from parental reports. Analyses were descriptive. RESULTS: Antibody persistence was high and similar in each group for each antigen except for Hep B, for which the percentage (95% confidence interval) of participants with a titer of >/= 10 mIU/mL was higher in group 2 (99.5% [97.5%, 100.0%]) than in group 1 (85.5% [80.3%, 89.8%]). Postbooster seroprotection (diphtheria, tetanus, inactivated poliovirus, polyribosyl-ribitol phosphate) and seroconversion (pertussis toxoid, filamentous hemagglutinin) rates were high and similar in each group, and geometric mean antibody concentrations increased markedly in both groups. Safety after the booster vaccination was good and independent of the primary-series vaccine, although one serious adverse event of convulsions was considered to be vaccine related. CONCLUSIONS: The DTaP-IPV//PRP-T booster vaccination at 18 months of age was similarly immunogenic and well tolerated after primary-series vaccination with either the investigational hexavalent vaccine or the reference pentavalent vaccine. This confirms the suitability of a booster vaccination of DTaP-IPV//PRP-T after a primary series of the new DTaP-IPV-Hep B-PRP-T vaccine.


Hepatitis A virus (HAV) has shown intermediate endemicity in Argentina, but its incidence has decreased since vaccine introduction in 2005. Environmental surveillance was conducted in five rivers from Argentina from 2005 to 2012, complementing clinical information. HAV detection decreased since 2005, although its circulation
The human immunodeficiency virus (HIV) and hepatitis C virus (HCV) share the same transmission routes which lead to high coinfection rates. Among HIV-infected individuals such rates reached 21% in Argentina, being HCV-1a the most predominant subtype. In this work, 25 HCV subtype 1a (HCV-1a) strains from Argentinean patients coinfected with HIV were studied based on E2 and NSSA sequences. Phylogenetic analyses indicated that 12 strains were highly related to each other, constituting a highly supported (posterior probability = 0.95) monophyletic group that we called "M." The remaining HCV strains (group dispersed or "D") were interspersed along the phylogenetic trees. When comparing both groups of HCV-1a, 10 amino acid differences were located in functional domains of E2 and NSSA proteins that appeared to affect eventually the peptides binding to MHC-I molecules thus favoring immune escape and contributing to the divergence of HCV genotypes. Bayesian coalescent analyses for HCV-1a cluster M isolates indicated that the time to the most recent common ancestor (tMRCA) overlaps with the age estimated recently for the HIV-BF epidemic in Argentina. Furthermore, the genomic characterization based on pol gene analysis from HIV viremic patients showed that most HIV isolates from patients coinfected with HCV-1a cluster M were BF recombinants with identical recombination patterns. In conclusion, these results suggest the presence of an HCV-1a monophyletic cluster with a potential HIV co-transmission by phylogenetic analyses.


BACKGROUND: This study was done to determine the immunogenicity of a single dose of hepatitis A vaccine in children, providing needed clinical data on the flexibility of booster administration. METHODS: Participants had received one dose of inactivated hepatitis A vaccine (Avaxim 80 U Pediatric) at 12-23 months of age or two doses of the same vaccine at 12 and 18 months of age prior to enrolment. Anti-hepatitis A antibody concentrations were measured at the first, second, and third year after vaccination. Suspected cases of hepatitis A were measured at the first, second, and third year after vaccination. Suspected cases of hepatitis A in participant families were assessed and family socioeconomic data were collected. RESULTS: A series of 546 participants were enrolled. Of 467 (85.5%) participants completing 3 years of follow-up, 365 had received a single vaccine dose and 94 had received two vaccine doses. Seropositivity (anti-HAV >/= 10 mIU/mL) was 99.7% after one dose and 100% after two doses. At one year, geometric mean concentrations were higher after two doses (1433.9 mIU/mL, 95% confidence interval [CI] 1108-1855) than one (209.7 mIU/mL, 95% CI 190.6-230.6). Geometric mean concentrations decreased in both groups during the study, but remained well above 10 mIU/mL through the third year. The geometric mean of 3-year to one-year anti-hepatitis A concentration ratios was 0.74 (95% CI 0.47-0.70) following one dose and 0.57 (95% CI 0.47-0.70) following two doses. The greatest decrease in geometric mean concentrations occurred during the third year, ie, 21.2% in the one-dose group and 40.8% in the two-dose group. Six participants became seronegative during follow-up and responded strongly to a booster dose. Anti-hepatitis A concentrations increased in 135 children (34.9%) in the second year and 50 (13.7%) in the third year; none lived in a family with a case of hepatitis A. Three confirmed cases of hepatitis A occurred in family members. Participants

continues, maintaining viral diversity but not undergoing antigenic drift. Most sequences belonged to subgenotype IA, closely related to Argentinean clinical sequences, but one belonged to proposed subgenotype IC, previously undetected in the country. Environmental surveillance might contribute to monitoring the single-dose vaccination schedule, representing not only strains causing disease but also the circulating population and the viral introductions.
belonged to a middle-income, urban/suburban population with good sanitation facilities and water supplies. CONCLUSION: A single dose of hepatitis A vaccine at 12-23 months of age resulted in hepatitis A seropositivity in all but one vaccinee after 3 years. Increased anti-hepatitis A serum concentrations suggested exposure to wild-type hepatitis A virus in this middle-class socioeconomic environment. Continuing surveillance is required to confirm the effectiveness of a single-dose hepatitis A vaccination; however, the results of the first three years are encouraging.


The global epidemiology of hepatitis C virus (HCV) may be roughly described by two groups of genotypes: the worldwide distributed ones (subtypes 1a, 1b, 2a and 3a, among others) and the endemic ones (subtypes 4a, 5a, 6a, among others). Epidemiological and population dynamic studies of the worldwide distributed genotypes have shown that subtypes 1a and 3a are common among intravenous drug users (IDUs) and that they are also in expansion in some countries. The molecular survey of HCV provides some clues about the epidemiological status of the infections in a local scale and the phylogenetic and demographic reconstruction analyses complement this study by inferring whether the infections of certain subtypes are in a steady state or expanding. Here, a molecular survey of the HCV variants that circulate in the touristic city of Mar del Plata (Buenos Aires, Argentina) was performed in samples obtained from 42 patients. The subtypes detected were 1a (32 patients), 3a (8 patients) and 1b (2 patients). The demographic history of subtype 1a inferred using the sequence data showed an exponential growth in the 1990’s. The period of viral expansion was delayed compared with that observed for the same genotype in other countries where the transmission was associated with IDUs. Also, the phylogeographic analysis of HCV-1a showed a statistically significant association between the location of the samples and the phylogeny, which may be the result of the local transmission of HCV in the city. The molecular analysis helped in the description of the complex epidemiological context of a touristic city, and pointed out that some sanitary measures should be taken in order to reduce the transmission of HCV (and maybe of HIV) among IDUs.


OBJECTIVES: Due to the scarce data on the prevalence of sexually transmitted infections (STIs) among male-to-female trans-sex workers (TSW) and male sex workers (MSW) in Argentina, the present study aimed to estimate the incidence of human immunodeficiency virus (HIV), and the prevalence of HIV, hepatitis B virus (HBV), hepatitis C virus (HCV), and Treponema pallidum. Human papillomavirus (HPV) and Chlamydia trachomatis infections were tested among TSW. METHODS: Two hundred and seventy-three TSW and 114 MSW were recruited by nongovernmental organizations. HIV incidence was estimated by STARHS (serologic testing algorithm for recent HIV seroconversion). HPV and C. trachomatis infections were tested in anal cells from TSW. RESULTS: TSW showed significantly higher prevalences of HIV (34.1 vs. 11.4%), HBV (40.2 vs. 22.0%), and T. pallidum (50.4 vs. 20.4%) than MSW. TSW tested positive for HPV in 111/114 cases and for C. trachomatis in 4/80 cases. Investigation of HBV, HCV, HIV, and T. pallidum co-infections showed that 72% of TSW and 39% of MSW had at least one STI. T. pallidum was the most frequent mono-infection. The estimated HIV incidence was 10.7 per 100 person-years (95% confidence interval (CI) 3.8-17.7) for TSW and 2.3 per 100 person-years (95% CI 0.6-7.0) for MSW. CONCLUSIONS: The high prevalence of STIs and the high incidence of HIV demonstrate the great vulnerability of these high-risk populations and indicate the urgent need for preventive strategies on intervention and facilitation of access to healthcare programs.


BACKGROUND AND AIMS: Genetic variations in the interleukin 28B (IL28B) gene have been associated with viral response to PEG-interferon-alpha/ribavirin (PR) therapy in hepatitis C virus (HCV) genotype 1 infected patients from North America, Europe and Asia. The importance of these IL28B variants for Argentine patients remains unknown. MATERIAL AND METHODS: IL28B host genotypes (rs8099917 and rs12979860) were determined in a population of Argentine patients with European ancestry. Results were analyzed looking for their association with sustained virologic response (SVR) to PR therapy and compared with other baseline hosts’ biochemical, histological and virological predictors of response. RESULTS: We studied 102 patients, 60% were men, and 40% of them were rs8099917 TT and 18% rs12979860 CC. Mean baseline serum HCV RNA was 1.673.092 IU/mL and mean F score was: 2.10 +/- 1.18 (21% cirrhotic). SVR rate was higher in rs8099917 TT genotypes (55%) when compared to GT/GG (25%) (p = 0.002) and in rs12979860 CC (64%) than in CT/TT (30%) (p = 0.004). The univariate analysis showed that rs8099917 TT (OR 3.7; 95 %CI 1.5-8.7; p = 0.002), rs12979860 CC (OR 4.6; 95%CI 1.5-13.7; p = 0.006), low viral load (OR 4.6; 95% CI 1.7-12.6; p = 0.002) and F0-2 (OR 8.5; 95% CI 2.3-30.6; p = 0.001) were significantly associated with SVR. In the multivariate analysis, rs8099917 CC, rs12979860 CC, viral load < 400.000 IU/mL and F0-2 were associated with SVR rates (p = 0.029, p = 0.012, p = 0.013 and p = 0.004,
hepatitis E virus in Argentina in HIV-coinfected patients from Argentina.

BACKGROUND AND AIMS: Assessment of a new, fully liquid, investigational hexavalent DTaP-IPV-Hep B-PRP-T vaccine in healthy 2-, 4-, and 6-month-old Argentinean infants. METHODS: Infants born to Hep B surface antigen seronegative mothers were randomized to receive the DTaP-IPV-Hep B-PRP-T vaccine or Pentaxim and Engerix B Pediatrico (Hep B monovalent) vaccines at 2, 4, 6 months of age. Antibody titers were measured before and 1 month after 3-month primary vaccination. Noninferiority analyses were performed on seroprotection/seroconversion rates. Safety was evaluated descriptively up to 1 month after primary vaccination. RESULTS: A total of 624 participants were enrolled, 312 participants were randomized to each group, and 604 participants completed the trial. The DTaP-IPV-Hep B-PRP-T vaccine was demonstrated as noninferior to the Pentaxim and Hep B monovalent vaccines with seroprotection/seroconversion rates 1 month postdose 3 for each valence. The anti-Hep B geometric mean titer 1-month postdose 3 for the investigational DTaP-IPV-Hep B-PRP-T primary series was similar to the monovalent Hep B control. The overall incidence of adverse events was similar among the 2 groups. CONCLUSIONS: The new, fully liquid, investigational DTaP-IPV-Hep B-PRP-T vaccine (Hexaxim) is highly immunogenic and safe when compared with licensed comparators, warranting further development.


BACKGROUND: In recent years, an increasing number of infections with genotype 3 hepatitis E virus (HEV) have been reported in western countries. Data in South America, however, are still scarce. Swine and human variants previously described in Argentina are closely related to a human Austrian one. OBJECTIVE: To identify whether HEV is still circulating in Argentina. STUDY DESIGN: Sera and stool samples from adults and children with unexplained acute liver disease referred to our center during the last six years were prospectively studied. Dual infection with hepatitis A was retrospectively studied in a group of children with fulminant hepatic failure. RESULTS: Fifteen new cases (13 adults and 2 children), seven of whom required hospitalization, were diagnosed. Nine had detectable HEV RNA, and one had imported genotype 1. Subgenotype 3i HEV-related variants are still circulating. Five autochthonous sequences, related to European, American and Japanese ones, grouped in subgenotype 3a. One case had a subgenotype 3b variant. DISCUSSION: The polyphyletic variants widespread in Argentina suggest multiple sources of infection. Whether or not their reservoir is swine merits further investigation. Since hepatitis E is still considered rare, differential laboratory testing in unexplained acute liver disease is not routinely performed in Argentina. Broadening awareness of this disease is important in light of the decrease in hepatitis A incidence since universal vaccination was implemented in 2005. The diagnosis of hepatitis E with a combination of serological and molecular tools is needed to better understand its epidemiology and impact on the clinical management of patients with unexplained increased transaminases.


During infection with the hepatitis A virus (HAV), most patients develop mild or asymptomatic disease. However, a small number of patients develop serious, life-threatening hepatitis. We investigated this variability in disease severity by examining 30 Argentinean patients with HAV-induced acute liver failure in a case-control, cross-sectional, observational study. We found that HAV-induced severe liver disease was associated with a 6-amino-acid insertion in TIM1/HAVCR1 (157insMTTTVP), the gene encoding the HAV receptor. This polymorphism was previously shown to be associated with protection against asthma and allergic diseases and with HIV progression. In binding assays, the TIM-1 protein containing the 157insMTTTVP insertion polymorphism bound HAV more efficiently. When expressed by human natural killer T (NKT) cells, this long form resulted in greater NKT cell cytolytic activity against HAV-infected liver cells, compared with the shorter TIM-1 protein without the polymorphism. To our knowledge, the 157insMTTTVP polymorphism in TIM1 is the first genetic susceptibility factor shown to predispose to HAV-induced acute liver failure. Furthermore, these results suggest that HAV infection has driven the natural selection of shorter forms of the TIM-1 protein, which binds HAV less efficiently, thereby protecting against severe HAV-induced disease, but which may predispose toward inflammation associated with asthma and allergy.


BACKGROUND AND AIMS: Assessment of a new, fully liquid, investigational hexavalent DTaP-IPV-Hep B-PRP-T vaccine (Hexaxim, Sanofi Pasteur), containing the same active ingredients as Pentaxim (DTaP-IPV//PRT-T) and 10 μg Hansenula polymorpha-derived recombinant hepatitis B (Hep B) surface antigen, Sanofi Pasteur, in Argentinean infants. METHODS: Infants born to Hep B surface antigen seronegative mothers were randomized to receive the DTaP-IPV-Hep B-PRP-T vaccine or Pentaxim and Engerix B Pediatrico (Hep B monovalent) vaccines at 2, 4, 6 months of age. Antibody titers were measured before and 1 month after 3-month primary vaccination. Noninferiority analyses were performed on seroprotection/seroconversion rates. Safety was evaluated descriptively up to 1 month after primary vaccination. RESULTS: A total of 624 participants were enrolled, 312 participants were randomized to each group, and 604 participants completed the trial. The DTaP-IPV-Hep B-PRP-T vaccine was demonstrated as noninferior to the Pentaxim and Hep B monovalent vaccines with seroprotection/seroconversion rates 1 month postdose 3 for each valence. The anti-Hep B geometric mean titer 1-month postdose 3 for the investigational DTaP-IPV-Hep B-PRP-T primary series was similar to the monovalent Hep B control. The overall incidence of adverse events was similar among the 2 groups. CONCLUSIONS: The new, fully liquid, investigational DTaP-IPV-Hep B-PRP-T vaccine (Hexaxim) is highly immunogenic and safe when compared with licensed comparators, warranting further development.


The prevalence of hepatitis C virus genotype 4 (HCV-4) is increasing in different parts of the World but in Latin
America the data are still scarce. We aimed to characterize HCV-4 isolates from 383 HIV-coinfected patients in Argentina. Sequence analyses were based on the non-structural 5B region of HCV. Results from 18 patients indicated a genetic heterogeneity that involved three genotype 4 subtypes. Sequences were ascribed to subtype 4d (67%), 4a (22%), and 4m (11%). In spite of different sources of transmission were defined among patients, no statistical association was found with the genotype 4 subtype. The scenario is also compatible with multiple importation of the epidemic and there is no evidence for transmission-specific clusters or network-like transmission of HCV-4. This HCV-4 does not represent a recent introduction in Argentina, it circulates in all transmission groups and its presence is increasing among HIV-infected patients.


A hepatitis A virus (HAV) recovered in Argentina from a stool sample of a sick child in the year 2006 (HAV-Arg/06) was entirely sequenced. Phylogenetic analysis included the HAV-Arg/06 sequence in subgenotype IA, either considering the usual VP1-2A variable junction fragment or the full length nucleotide sequence. Interestingly, a recombination event with subgenotype IB, involving a portion of the 2C-3A nonstructural proteins coding region (nucleotides 4961-5140) was detected using specific software. Only subgenotype IA strains have been detected in Argentina or Uruguay, whereas subgenotype IA and IB strains have been reported to circulate in Brazil. Although recombination has been given an important role in the evolution of picornaviruses, there have been only a few reports of its involvement in the evolution of HAV, probably due to the limited number of complete HAV sequences available. This study constitutes the first report of a full-length HAV sequence in Argentina and the third in South America, after the sequence of the IA isolate HAV5 from Uruguay and the IB isolate HAF-203 from Brazil. The availability of new sequence data covering the complete HAV genome will help establish a more consistent genetic relatedness among HAV isolates and the role of recombination in its evolution.


The Hepatitis C Virus Genotype 2 subtype 2c (HCV-2c) is detected as a low prevalence subtype in many countries, except in Southern Europe and Western Africa. The current epidemiology of HCV in Argentina, a low-prevalence country, shows the expected low prevalence for this subtype. However, this subtype is the most prevalent in the central province of Cordoba. Cruz del Eje (CdE), a small rural city of this province, shows a prevalence for HCV infections of 5%, being 90% of the samples classified as HCV-2c. In other locations of Cordoba Province (OLC) with lower prevalence for HCV, HCV-2c was recorded in about 50% of the samples. The phylogenetic analysis of samples from Cordoba Province consistently conform a monophyletic group with HCV-2c sequences from all the countries where HCV-2c has been sequenced. The phylogeographic analysis showed an overall association between geographical traits and phylogeny, being these associations significant (alpha = 0.05) for Italy, France, Argentina (places other than Cordoba), Martinique, CdE and OLC. The coalescence analysis for samples from CdE, OLC and France yielded a Time for the Most Common Recent Ancestor of about 140 years, whereas its demographic reconstruction showed a "lag" phase in the viral population until 1880 and then an exponential growth until 1940. These results were also obtained when each geographical area was analyzed separately, suggesting that HCV-2c came into Cordoba province during the migration process, mainly from Europe, which is compatible with the history of Argentina of the early 20th century. This also suggests that the spread of HCV-2c occurred in Europe and South America almost simultaneously, possibly as a result of the advances in medicine technology of the first half of the 20th century.


**INTRODUCTION:** Hepatitis A virus (HAV) infection is a vaccine-preventable disease. The most severe complication in children is fulminant hepatic failure (FHF), estimated to occur in 0.4% of cases; patients with FHF often require a liver transplant (LT). Following another outbreak of HAV infection in Argentina during 2003-2004, a one-dose HAV universal immunization (UI) program was started in 2005, resulting in a reduction in the incidence of HAV infection. We have investigated the impact of HAV UI on the trends in the occurrence of FHF and LT in children.

**METHODS:** All pediatric cases of FHF admitted to four pediatric centers in Buenos Aires during March 1993-July 2005 were retrospectively reviewed, and data of cases during August 2005-December 2008 were collected. Information about demography, HAV infections and vaccination status, diagnostic data for FHF using the Pediatric Acute Liver Failure criteria, clinical laboratory results, encephalopathy, the severity of liver disease using the Pediatric End Stage Liver Disease score, assessment of patients on the LT waiting list using King’s College Criteria for LT, treatment given for FHF (pre- and post-transplant), and clinical outcome were collected using a case report form. The frequency and outcomes of HAV-associated FHF and LT cases before and after UI were analyzed. **RESULTS:** During the pre-immunization period, March 1993-July 2005, 54.6% (N = 165) of FHF cases were caused by HAV; HAV-associated FHF cases peaked during 2003-2004. During the post-immunization period, August 2005-December 2008, only 27.7% (N = 18) of FHF cases were caused by HAV infection; only one of these patients had received the HAV vaccine (one dose only). The number of HAV-associated FHF cases decreased from 2005, and no
cases were reported from November 2006-December 2008. Multivariate analyses showed that the association of FHF with HAV infection rather than other etiologies decreased with increasing age ($P = 0.03$), UI against HAV ($P = 0.002$), and anti-actin antibodies ($P = 0.002$), and increased with increasing weight ($P = 0.0004$). CONCLUSIONS: The number of children with HAV-associated FHF in Argentina has strongly decreased since the initiation of the UI program. Further monitoring is required to confirm the long-term health and economic benefits of UI against HAV infection.


OBJECTIVES: To investigate the detection of hepatitis A virus ribonucleic acid in patients with acute liver failure and to assess if the results have any clinical implications for the evolution of acute liver failure in children. Hepatitis A infection, a vaccine-preventable disease, is an important cause of acute liver failure in children in Argentina. Universal vaccination in 1-yr-old children was implemented in June 2005. DESIGN: Observational study in which patients were divided into Group 1 consisting of positive hepatitis A virus ribonucleic acid and Group 2 consisting of negative hepatitis A virus ribonucleic acid. SETTING: Pediatric intensive care unit in National Pediatric Hospital "Dr. J. P. Garrahan," Buenos Aires, Argentina. PATIENTS: Thirty-three patients with the diagnosis of acute liver failure secondary to hepatitis A virus infection and admitted to the Garrahan Pediatric Hospital between September 2003 and September 2005 were enrolled in the study. Twenty of these children were admitted to the pediatric intensive care unit. INTERVENTIONS: None. MEASUREMENTS AND MAIN RESULTS: Samples for total ribonucleic acid detection and genotyping were obtained from serum and/or stools on admission. We found positive hepatitis A virus ribonucleic acid in 13 patients and negative hepatitis A virus ribonucleic acid in 20 patients. The following clinical variables were evaluated: time of evolution, hospital stay, admission to the pediatric intensive care unit, pediatric intensive care unit stay, time on mechanical ventilation, criteria for orthotopic liver transplantation, and mortality. Characterization of the isolates did not reveal differences related to genotype; all cases were IA. No statistical significance was found as to the variables. However, positive hepatitis A virus ribonucleic acid showed lower percentages of pediatric intensive care unit admissions, criteria for orthotopic liver transplantation, number of orthotopic liver transplantation, and mortality than the group of patients with negative hepatitis A virus ribonucleic acid. CONCLUSIONS: Hepatitis A virus genotyping studies did not show any particularities, all cases were IA and, thus, apparent associations between genotype and the clinical presentation of acute liver failure could not be found.


We examined long-term anti-hepatitis A virus antibody persistence in Argentinean children 10 years after the initial study in which they received 2 doses of inactivated hepatitis A vaccine (Avaxim 80U). Of the 111 children, 48 from the initial trial were enrolled. Of 48, 47 (97.9%) participants had serum anti-hepatitis A virus antibody titers > or = 20 mIU/mL, with the geometric mean concentration of 390.91 (+/-370.14) mIU/mL; (95% confidence interval, 282.2-499.5 mIU/mL), range, 36 to 1860.


In a previous cohort study among 327 men who have sex with men (MSM) in Buenos Aires, an HIV incidence rate of 3.9 per 100 persons-year was reported. Using data from this study, we determined: (a) HIV/STI co-infections; (b) clinical manifestations of incident HIV infections; (c) syphilis incidence and its associated risk factors; and (d) adherence and immune response to hepatitis B virus (HBV) vaccine. During the cohort study, 12 incident HIV infections were found. Within this group, HIV infection alone was most frequent (42%), followed by co-infection of HIV/HBV (33%), and triple co-infection of HIV/HBV/syphilis (25%). The most frequent clinical manifestations among incident HIV cases were: pharyngitis, fever, lymphadenopathy, asthenia, and myalgia. Seven new syphilis infections were detected yielding an incidence rate of 2.4 (95% CI=1.07 - 4.73) per 100 persons-year. Sex work was the only significant risk factor associated with syphilis seroconversion (hazard rate=10.93, p-value=0.033). Only 7% of cohort participants reported having received HBV vaccine. Ninety-percent of the 204 cohort members who agreed to be vaccinated completed the HBV vaccination schedule with an immune response rate of 85%. Our findings suggest the need to increase the access to serologic testing for STI and HBV immunization, as well as the developing of effective HIV/STI behavioral and educational prevention programs among MSM in Buenos Aires.

OBJECTIVES: To determine the frequency of occupational blood and body fluid exposure (OBBFE) among the nursing staff at a reference hospital in Buenos Aires, Argentina.


OBJECTIVES: To determine the frequency of occupational blood and body fluids exposure (OBBFE) among the nursing staff at the Dr. Diego Paroissien Hospital in Buenos Aires, Argentina; analyze the possible risk factors associated; and assess the level of knowledge regarding universal precautions and procedures following exposure.

METHODS: A cross-sectional descriptive study was performed using a voluntary and anonymous survey administered between April and May 2005. In addition to personal and professional data, information was collected on knowledge and practice of universal precautions and procedures, OBBFE experienced, barriers to following the standards, and whether or not the Hepatitis B vaccine had been received. The dependent variable in the analysis was ever having experienced an OBBFE accident.

RESULTS: Of the 186 responses analyzed, 77.7% of staff had an OBBFE accident: 71% had a history of post-exposure prophylaxis (PEP) and 29% had not been vaccinated. The main risk factors were: being female, the mean age was 44.6 +/- 8.9 years, and the institution was 13.3 +/- 6.4 years old. Of those who experienced an OBBFE accident, 91% had a history of PEP, and 58% had received the Hepatitis B vaccine. The main barriers to following the standards were: lack of knowledge, fear of infection, and time constraints.

CONCLUSIONS: The frequency of OBBFE among nursing staff at the Dr. Diego Paroissien Hospital in Buenos Aires, Argentina, was high. The main risk factors were being female, being a nurse, and working in a hospital. The main barriers to following the standards were lack of knowledge, fear of infection, and time constraints. The study highlights the need for improved training and education for nursing staff to reduce the frequency of OBBFE accidents and improve adherence to universal precautions and procedures.


The aim was to determine whether the immunogenicity of an investigational hepatitis B vaccine (spHB) is at least as high as that of a licensed control vaccine, Engerix B, and to evaluate its safety before inclusion in new pediatric combination vaccines. Two randomized, controlled, blind-observer, Phase 3 trials were performed: one in Argentina (344 participants aged 10-15 years, 10 microg HBsAg/dose) and one in Uruguay (344 participants aged 16-45 years, 20 microg HBsAg/dose). Both vaccines were given in a 0, 1, 6 month schedule to all participants with a baseline anti-Hep B antibody titer <0.6 mIU/mL. Antibody titers were measured pre-dose 1, 1 month after dose 2, pre-dose 3, and 1 month after dose 3. Statistical non-inferiority analyses were performed on seroprotection rates (SP) post-dose 3 (% with anti-Hep B titers >or=10 mIU/mL; delta non-inferiority limit of -10%). In both studies, SP for the spHB vaccine was 100% and the spHB vaccine was non-inferior in terms of SP to the licensed control vaccine. GMTs post-dose 3 were approximately 1.8- and 4.1-fold higher for spHB in the 10-15 year and 16-45 year age groups, respectively. Reactogenicity was low for each vaccine, after each dose. This highly immunogenic hepatitis B candidate vaccine was selected for further investigation as a component of new pediatric combination vaccines.


BACKGROUND: Knowledge of Hepatitis C virus genotype (HCV) present in a patient has an epidemiological interest. In addition, it has an important prognostic value that guides the duration and success of treatment.

AIMS: To analyze the distribution of genotypes in HCV-positive patients and linking them with the viral load before and after treatment, evaluating sustained viral response.

PATIENTS AND METHODS: We retrospectively analyzed the results of genotyping and HCV viral load of 71 patients during the period January 2001 to May 2009. The genotypes were determined by RFLP (restriction fragment length polymorphism) and the viral load by NASBA HVC quantitative. Statistical analysis was performed using the Infostat program.

RESULTS: 59% of patients were women. The frequency of genotypes was: 39% type 1, 58% type 2 and 3% type 3. We do not find a cutoff value of viral load to identify the different genotypes, although patients with genotype 1 had a higher number of viral copies than those of genotype 2 (p <0.0001). After treatment, 95% of patients with genotype 2 had a sustained viral response versus 67% of patients with genotype 1.

CONCLUSIONS: The genotype 2 was the most prevalent in our population. It also confirmed the impact of knowledge of HCV genotype on sustained viral response, which was related related surgical interventions to infection with HCV type 2.


Previous studies in Argentina have documented a general prevalence of Hepatitis C Virus (HCV) infection close to 2%. In addition, a high prevalence of HCV has been recently reported in different Argentinean small rural communities. In this work, we performed a study aimed at analyzing the origins and diversification patterns of an HCV outbreak in Wheelwright, a small rural town located in Santa Fe province (Argentina). A total of 89 out of 1814 blood samples collected from people living in Wheelwright, were positive for HCV infection. The highest prevalence (4.9%) was observed in people older than 50 years, with the highest level for the group aged between 70-79 years (22%). The RFLP analyses showed that 91% of the positive samples belonged to the HCV-1b genotype. The E1/E2 and NS5B genes were sequenced, and their phylogenetic analysis showed that the HCV-1b sequences from Wheelwright were monophyletic. Bayesian coalescent-based methods were used to estimate substitution rates and time of the most recent common ancestor (tMRCA). The mean estimated substitution rates and the tMRCA for E1/E2 with and without HVR1 and NS5B were 7.41E-03 s/s/y and 61 years, 5.05E-03 s/s/y and 58 years and 3.24E-03 s/s/y and 53 years, respectively. In summary, the tMRCA values, the demographic model with constant population size, and the fact that the highest prevalence of infection was observed in elder people support the hypothesis that the HCV-1b introduction in Wheelwright initially occurred at least five decades ago and that the early epidemic was characterized by a fast rate of virus transmission. The epidemic seems to have been controlled later on down to the standard transmission rates observed elsewhere.

The aim was to determine whether the immunogenicity of an investigational hepatitis B vaccine (spHB) is at least as high as that of a licensed control vaccine, Engerix B, and to evaluate its safety before inclusion in new pediatric combination vaccines. Two randomized, controlled, blind-observer, Phase 3 trials were performed: one in Argentina (344 participants aged 10-15 years, 10 microg HBsAg/dose) and one in Uruguay (344 participants aged 16-45 years, 20 microg HBsAg/dose). Both vaccines were given in a 0, 1, 6 month schedule to all participants with a baseline anti-Hep B antibody titer <0.6 mIU/mL. Antibody titers were measured pre-dose 1, 1 month after dose 2, pre-dose 3, and 1 month after dose 3. Statistical non-inferiority analyses were performed on seroprotection rates (SP) post-dose 3 (% with anti-Hep B titers >or=10 mIU/mL; delta non-inferiority limit of -10%). In both studies, SP for the spHB vaccine was 100% and the spHB vaccine was non-inferior in terms of SP to the licensed control vaccine. GMTs post-dose 3 were approximately 1.8- and 4.1-fold higher for spHB in the 10-15 year and 16-45 year age groups, respectively. Reactogenicity was low for each vaccine, after each dose. This highly immunogenic hepatitis B candidate vaccine was selected for further investigation as a component of new pediatric combination vaccines.
surveyed, 91 (48.9%) indicated that at some time they had an OBBFE, with 33 (17.7%) of these having occurred during the previous year; 73.0% confirmed that the tools necessary for complying with universal precautions were available always or almost always; 76.2% felt they had complete information, although 56.3% said they had not received adequate training; and, 94.1% claimed to have been vaccinated against Hepatitis B. Being overworked (54.5%), insufficient training (21.8%), and a lack of protective tools (18.8%) were the reasons most often identified as impeding compliance with universal precaution guidelines. Not having received training during the preceding year and having recently started work in a clinical or adult intensive-care unit were significantly associated with having experienced an OBBFE: CONCLUSIONS: These results signal a risk alert for OBBFE among health care workers and underscore the need for improving standards and surveillance.


OBJECTIVE: To study socio-demographics, sexual practices, drug use behaviors, and prevalences of HIV, syphilis, hepatitis B and C, HTLV-1 and HTLV-2 in immigrant (foreigner) and non-immigrant (local/native) female sex workers (FSW). DESIGN: This was a cross-sectional study in immigrant and non-immigrant FSW living in Buenos Aires, Argentina. Participants were interviewed using a standardized questionnaire. RESULTS: A total of 625 FSW were enrolled, of whom 169 (27%) were immigrant FSW from Paraguay, the Dominican Republic, Brazil, Peru, and Uruguay. The prevalence of syphilis and hepatitis C was significantly higher among Argentinean FSW than among immigrant FSW. However, hepatitis B prevalence was higher among immigrant FSW. Adjusted risk factor analysis comparing immigrant FSW with Argentinean FSW indicated that marital status (single), occupation (none), fee per sex act (<or=USD7), workplace (bar and cabaret), and anal sex with clients were significantly associated with immigrant FSW status. CONCLUSIONS: Effective HIV/STI prevention and medical care programs need to be tailored to the specific needs of both FSW groups in Argentina.
2.2 Hepatitis in Bolivia

Pubmed MEDLINE search on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Bolivia) NOT autoimmune in all fields, filter (REVIEW and since 10 year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Bolivia were selected. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.


BACKGROUND: Since 2000 universal routine immunization against the hepatitis B virus (HBV) was implemented in Bolivia. This study aimed to assess the seroprevalence of markers against HBV in two different birth cohorts (pre-universal vaccine cohort and post-universal vaccine cohort) from Cochabamba, Bolivia. METHODS: We performed a school-based seroepidemiological survey (n = 424) of HBV in 2010 in the Cochabamba region. An ELISA test was used to measure antibodies to the hepatitis B surface antigen (anti-HBs IgG) and to the hepatitis B core antigen (anti-HBc IgG). RESULTS: The prevalence of anti-HBs IgG in the pre-universal vaccine cohort was 5.8% (95% CI: 3.3-8.3%); it was higher in boys (9.1%), and those living in suburbs (9.7%). The anti-HBs IgG prevalence among post-universal vaccine cohort was 37.9% (95% CI: 28.5-48.1%), and was higher in children who spoke Quechua at home (51.0%), those living in suburbs (53.9%), and those born in 2005 (72.7%). Neither cohort showed differences relating to parental education. The prevalence of anti-HBc IgG was 1.1% among post-universal vaccine cohort and 1.2% among pre-universal vaccine cohort (p > 0.05). CONCLUSIONS: This study identified a persistent low seroprevalence of hepatitis B infection in spite of a decade of universal immunization, and low long-term humoral immunity against HBV infection in vaccinated children in Cochabamba.


The seroprevalence of hepatitis A virus (HAV) is changing from high to intermediate endemicity in several Latin American countries, but the pattern in the Andean Latin American countries is unknown. A seroepidemiological survey (n = 436) of HAV in schoolchildren living in the Cochabamba region of Bolivia was conducted in 2010. A questionnaire was completed by parents to obtain demographic, socio-economic, and housing data, and blood samples were collected. The overall prevalence of HAV IgG was 95.4% (95% CI 93.5-97.4). The prevalence was higher in children aged 5-10 years (97%) and pre-adolescents aged 10-13 years (97.9%). The prevalence was also higher in subjects whose parents had a low level of education (99.4-99.5%), who lived in rural areas (98.7%), lived in municipalities with low urban development (99.1-100%), had water delivered at home from a tanker (99.4%), and spoke Quechua at home (99.5%). The descriptive and bivariate analysis suggested that no change in HAV epidemiology has occurred in Cochabamba.


We determined the seroprevalence of hepatitis E virus (HEV) in persons in 2 rural communities in southeastern Bolivia and the presence of HEV in human and swine fecal samples. HEV seroprevalence was 6.3%, and HEV genotype 3 strains with high sequence homology were detected.
This report shows the outcome of a coordinated effort by locals, foreign institutions, and an international agency, from 1996-2002, aimed at preventing transmission of blood-borne diseases in Santa Cruz, Bolivia. From 2001-2002, testing the donor pool for HIV prevented transfusion of 32 infected units and 29 infections. With 100% screening coverage, 196 hepatitis B virus (HBV)-infected units were discarded, and 177 infections of HBV were prevented between 1999 and 2002. Incomplete screening for hepatitis C virus (HCV) may have tainted nine units of blood and generated eight HCV infections in 1999. On the other hand, 600 units infected with HCV were discarded, and 540 HCV infections were prevented between 1999 and 2002. Screening for Chagas disease prevented transfusion of 10,661 tainted units and 2,133 infections from 1999 to 2002. From 1996-2002, the investment was US$1,108,000.


Hepatitis B virus genotypes are associated with transmission pattern, virological and clinical features and outcome of the chronic infection course. HBV genotypes other than Genotype F (HBV/F) are considered a reflection of human migration into South America. A total of 487 individuals in Bolivia, including Japanese immigrants (n=287) and natives (n=200), were screened for HBV serological markers. Overall 22/487 (4.5%) of the subjects were positive for HBsAg, 217/487 (44.5%) for anti-Hbc and 162/487 (33.3%) for anti-HBs. Genotypes were determinable in 22 cases by EIA, followed by sequencing and phylogenetic analysis in 17 cases. HBV genotype distribution in Japanese and Bolivians was HBV/F (4 and 8); HBV/C (5 and 3); and HBV/B (1 and 1), respectively. Phylogenetic analyses of nine complete and eight partial (HBsAg/pre-core/core region) genomes, revealed that HBV/F strains cluster with previously reported regional strains, whereas HBV/B and HBV/C strains belonged to Asian subgenotype B2 (Ba) and C2 (Ce), respectively. Japanese immigrants might have introduced HBV/B and HBV/C to natives in Bolivia, conversely, exposed to the indigenous HBV/F. This report provides evidence of an inter-communities transmission of HBV revealed by its genotypes. Further study is required to investigate peculiarities of the genotypes in different ethnic groups in Bolivia.


BACKGROUND: Hepatitis C virus (HCV) has been the subject of intense research and clinical investigation as its major role in human disease has emerged. Previous and recent studies have suggested a diversification of type 1 HCV in the South American region. The degree of genetic variation among HCV strains circulating in Bolivia and Colombia is currently unknown. In order to get insight into these matters, we performed a phylogenetic analysis of HCV 5' non-coding region (5'NCR) sequences from strains isolated in Bolivia, Colombia and Uruguay, as well as available comparable sequences of HCV strains isolated in South America. METHODS: Phylogenetic tree analysis was performed using the neighbor-joining method under a matrix of genetic distances established using the Kimura-two parameter model. Signature pattern analysis, which identifies particular sites in nucleic acid alignments of variable sequences that are distinctly representative relative to a background set, was performed using the method of Korber & Myers, as implemented in the VESPA program. Prediction of RNA secondary structures was done by the method of Zuker & Turner, as implemented in the mfold program. RESULTS: Phylogenetic tree analysis of HCV strains isolated in the South American region revealed the presence of a distinct genetic lineage inside genotype 1. Signature pattern analysis revealed that the presence of this lineage is consistent with the presence of a sequence signature in the 5'NCR of HCV strains isolated in South America. Comparisons of these results with the ones found for Europe or North America revealed that this sequence signature is characteristic of the South American region. CONCLUSION: Phylogenetic analysis revealed the presence of a sequence signature in the 5'NCR of type 1 HCV strains isolated in South America. This signature is frequent enough in type 1 HCV populations circulating South America to be detected in a phylogenetic tree analysis as a distinct type 1 sub-population. The coexistence of distinct type 1 HCV subpopulations is consistent with quasispecies dynamics, and suggests that multiple coexisting subpopulations may allow the virus to adapt to its human host populations.


Hepatitis B virus (HBV) strains were classified into eight genotypes from A to H. Genotype F, an indigenous genotype in Central and South America, has been classified into subgenotypes. An in-depth phylogenetic analysis was performed using two full-length Bolivian HBV sequences and other genotype F strains from the database. A novel nomenclature of subgenotypes of genotype F was proposed, in which Bolivia strains belonged to subgenotype F4. This subgenotype had both Leu(45) and Ile(110) in the S gene, and linked to the T(1858) in the precore. This novel nomenclature demonstrated the relation between variability of the HBV genome and the restricted geographical distribution of the virus in some parts of Central and South America.
2.3 Hepatitis in Chili


Although there is a low prevalence rate (around 1% of the population) of infection with hepatitis B virus (HBV) and hepatitis C virus (HCV) in Chile, little is known about the diversity and molecular characteristics of the circulating viruses. In the present study, 40 HBV and 57 HCV samples from Santiago City, Chile, were examined. The phylogenetic analysis of HBV samples showed the autochthonous genotype F as the most represented genotype in the study (67.5%), while genotypes A, B, C, and D were less frequent (7.5%, 5%, 7.5%, and 12.5%, respectively). The frequency of circulation of HBV genotypes observed is in accordance with the genetic background of the Chilean population. Most of the HCV samples tested belonged to subtype 1b (82%). The coalescent analysis conducted for both the NS5A and NS5B regions of the HCV strains showed similar population growth rates, with a most recent common ancestor estimated to date between 1893 and 1901. This result may indicate that genotype 1b strains circulating in Chile have epidemiological features similar to those described for HCV genotype 1b in Brazil and the United States. However, the most recent common ancestor for Chile is older than that reported recently for genotype 1b in Argentina.


Hepatitis C virus-associated chronic hepatitis is one of the most important causes of liver-related mortality and morbidity worldwide. This review analysis the available clinical and epidemiological information about this disease in Chile and compares it with data available from Latin America and other countries. Chronic hepatitis C seroprevalence in the general Chilean population is 1.15% by ELISA III and 0.85% by recombinant immunoblot assay (RIBA). Mortality due to cirrhosis (all causes) in Chile is one of the highest in the world. We show indirect evidence that chronic hepatitis C may account for a significant proportion of these deaths. The disease is the most common cause for liver transplantation in adults. Based on the available information, we conclude that chronic hepatitis C is an important cause of disease and mortality in Chile.

2.4 Hepatitis in Colombia

Screening for hepatitis A virus (HAV) infection is not currently routinely recommended in internationally adopted children. International adoptees seen at the University of Minnesota International Adoption Clinic from 2006 to 2010 were assessed for acute HAV infection (positive HAV immunoglobulin M). Thirty of the 656 children screened (4.6%) were acutely HAV infected. HAV-infected children emigrated from Ethiopia (16), Guatemala (4), China (2), Colombia (2), Haiti (2), Philippines (2), Liberia (1), and Nepal (1). Infection was most frequent among children younger than 2 years (6.7%). No symptoms distinguished children with acute HAV infection from uninfected children. HAV infection caused significant social disruption, including separation of children from their ill adoptive parents during the initial weeks postarrival, a period important for postadoption adjustment and attachment. All international adoptees arriving from countries with high or intermediate HAV endemicity should be screened for HAV infection on arrival to the United States.


AIMS: Estimating the force of hepatitis A virus (HAV) infection concerning a 1- to 15-year-old child population being attended at six healthcare centres in Colombia by applying catalytic models. METHODS: Anti-HAV seroprevalence was estimated in 2,152 patients attending six health centres in 5 Colombian cities; based on such estimation, the force of infection and average age of infection were obtained for each region. RESULTS: The 1- to 4-year-old age group's force of infection was 0.15 in Barranquilla; for the other cities the force of infection was 0.02 in Bogota for the 5- to 15-year-old age group and 0.06 in Medellin for the 1- to 9-year-old age group. Average infection age in Bogota, Bucaramanga, Cali and Medellin was 10.68 to 11.97 years-old. CONCLUSION: There was high anti-HAV prevalence in the young-adult population, average infection age being 10.69 to 11.97 years-old, thereby presenting a similar pattern to that of developing regions having intermediate level of endemicity.


BACKGROUND: Hepatitis C virus (HCV) infects 170 million persons worldwide and is a public health problem. Considering that HCV is principally transmitted by exposure to infected blood, multi-transfused patients constitute one of the most important risk groups in developing countries. To explore the dynamics of this infection in Colombia, we performed a study to determine the genotypes of HCV in a cohort of multi-transfused patients. RESULTS: The serum samples from patients positive for anti-HCV were evaluated for HCV RNA by nested-PCR of the 5'untranslated region (5'UTR). Viral genotype was determined by RFLP and/or automated sequencing. HCV subtype 1b was found in eight cases (66.7%) and subtype 1a in two cases (16.7%); seven isolates of subtype 1b were obtained from patients who had received the first transfusion before 1986. Either genotypes 2b (8.3%) or 3a (8.3%) were found in the remaining positive specimens. CONCLUSIONS: This is the first HCV genotyping study developed in multi-transfused patients in Colombia where HCV subtype 1b was the most prevalent. The mutation G235A in the 5'UTR of three isolates generated an additional restriction site and an RFLP pattern different from those previously described for genotype 1.


OBJECTIVE: To determine the seroprevalence of markers of transfusion transmissible infections in donors of a blood bank in Medellin, Colombia, between 2007 and 2010. METHODS: A cross-sectional secondary data source, based on the results of biological testing of donors to a blood bank in Medellin. We determined the seroprevalence of markers of infection and were compared by sex and type of donor through frequency analysis, chi square, Fisher and prevalence ratios. RESULTS: The base population was 65,535 donors, and 3.3% had at least one positive biological test. The most prevalent marker in the blood bank testing was syphilis (1.2%), followed by trypanosomiasis (1.0%), hepatitis C virus (HCV) (0.6%), human immunodeficiency virus (HIV) 0.5% and hepatitis B virus (HBV) (0.2%). Based on the reference laboratory found a prevalence of 0.6% for syphilis, 0.1% for (HBV) and 0% for (HCV), (HIV) and Chagas. We found statistical differences in the prevalence of (HBV) and syphilis by sex and type of donor. CONCLUSIONS: The results are consistent with the prevalences given by Pan American Health Organization and can be correlated with the global prevalence of transfusion-transmitted infections. The results founds by the blood bank lead to a transfusion risk reduction but limit the optimization of resources by excluding donors classified as false positives.

important HCC risk factors are Hepatitis B Virus (HBV) and/or Hepatitis C Virus (HCV), chronic alcoholism, and dietary exposure to aflatoxins. We have described the epidemiological pattern of 202 HCC samples obtained from Colombian patients. Additionally we investigated HBV/HCV infections and TP53 mutations in 49 of these HCC cases. HBV biomarkers were detected in 58.1% of the cases; HBV genotypes F and D were characterized in three of the samples. The HCV biomarker was detected in 37% of the samples while HBV/HCV coinfection was found in 19.2%. Among TP53 mutations, 10.5% occur at the common aflatoxin mutation hotspot, codon 249. No data regarding chronic alcoholism was available from the cases. In conclusion, this first study of HCC and biomarkers in a Colombian population, the main HCC risk factor was HBV infection.


Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections are the principal risk factor associated to end-stage liver diseases in the world. A study was carried out on end-stage liver disease cases admitted to an important hepatology unit in Medellin, the second largest city in Colombia. From 131 patients recruited in this prospective study, 71% of cases were diagnosed as cirrhosis, 12.2% as HCC, and 16.8% as cirrhosis and HCC. Regarding the risk factors of these patients, alcohol consumption was the most frequent (37.4%), followed by viral etiology (17.6%). Blood and/or hepatic tissue samples from patients with serological markers for HCV or HBV infection were characterized; on the basis of the phylogenetic analysis of HCV 5′ UTR and HBV S gene, isolates belonged to HCV/1 and HBV/F3, respectively. These results confirm the presence of strains associated with poor clinical outcome, in patients with liver disease in Colombia; additionally, HBV basal core promoter double mutant was identified in HCC cases. Here we show the first study of cirrhosis and/or HCC in Colombian and HBV and HCV molecular characterization of these patients. Viral aetiology was not the main risk factor in this cohort but alcohol consumption.


INTRODUCTION: In Colombian blood banks, screening for the surface antigen of hepatitis B is mandatory in all units collected. Testing of antibody against core antigens is not administered, although this method may be useful to detect donors infected with the hepatitis B virus. OBJECTIVE: The prevalence of occult hepatitis B was determined by applying a full-serological profile of hepatitis B virus to blood samples of blood donors. MATERIALS AND METHODS: Between April 2008 and October 2009, a prospective cross sectional study was conducted using 628 samples from donors to blood banks located in four Colombian cities. Prevalence for hepatitis B had been previously recorded for these cities. Serological screening was performed for the complete virus; then nucleic acid amplification was tested in sera that were anti-HBc reactive and with a titer of anti-HBs ≤30 mUI/ml. RESULTS: Of the 628 samples tested, 129 met the serological criteria established to be tested nucleic acid amplification. None of them demonstrated evidence of nucleic acid amplification of hepatitis B virus. CONCLUSIONS: This is the first study in Colombia to detect the presence of blood donors that may be occult hepatitis B carriers. None was detected.


Hepatitis B is a worldwide health problem affecting about 2 billion people and more than 350 million are chronic carriers of the virus. Nine HBV genotypes (A to I) have been described. The geographical distribution of HBV genotypes is not completely understood due to the limited number of samples from some parts of the world. One such example is Colombia, in which few studies have described the HBV genotypes. In this study, we characterized HBV genotypes in 143 HBsAg-positive volunteer blood donors from Colombia. A fragment of 1306 bp partially comprising HBsAg and the DNA polymerase coding regions (S/POL) was amplified and sequenced. Bayesian phylogenetic analyses were conducted using the Markov Chain Monte Carlo (MCMC) approach to obtain the maximum clade credibility (MCC) tree using BEAST v.1.5.3. Of all samples, 68 were positive and 52 were successfully sequenced. Genotype F was the most prevalent in this population (77%) - subgenotype F3 (75%) and F1b (2%). Genotype G (7.7%) and subgenotype A2 (15.3%) were also found. Genotype G sequence analysis suggests distinct introductions of this genotype in the country. Furthermore, we estimated the time of the most recent common ancestor (TMRCA) for each HBV/F subgenotype and also for Colombian F3 sequences using two different datasets: (i) 77 sequences comprising 1306 bp of S/POL region and (ii) 283 sequences comprising 681 bp of S/POL region. We also used two other previously estimated evolutionary rates: (i) 2.6 × 10(-4)/s/y and (ii) 1.5 x 10(-5)/s/y. Here we report the HBV genotypes circulating in Colombia and estimated the TMRCA for the four different subgenotypes of genotype F.


BACKGROUND: Hepatitis A vaccination is justified in areas with an intermediate endemicity of the infection. Aim:
To estimate the epidemiological impact of hepatitis A infection in Colombia. MATERIAL AND METHODS: Epidemiological indicators of hepatitis A infection prevalence by age, morbidity by age, and lethality by age were estimated from a literature search. These measures were projected on a hypothetical cohort of children followed from birth until 15 years of age. The number of cases of infection, jaundice, hepatic failure, hospitalizations and deaths were estimated. RESULTS: From birth to adolescence, a cohort of 872,923 urban children in Colombia would generate between 312,331 and 598,591 infections, between 13,586 and 25,960 hospitalizations, between 213 and 407 hepatic failures and between 107 and 204 deaths. CONCLUSIONS: The impact of hepatitis A infection in Colombia, is important. Introducing hepatitis A vaccination would reduce a substantial number of severe hepatitis A cases.

INTRODUCTION: Quibdo, the capital of Choco Province, is one of the poorest cities in Colombia. Enteric viruses such as rotavirus and hepatitis A virus was found to occur commonly in city drinking water and indicated poor water quality and high risk of becoming infected. The source of these viruses was unknown, but humans and cattle were suspect sources. OBJECTIVE: City water was assessed to determine source and persistence of diarrhea and hepatitis among the human populations in the environs of Quibdo. MATERIAL AND METHODS: Four thousand liters of water were collected, filtered by tangential ultrafiltration and centrifuged in Centriprep Ultracel YM-50 tubes. Sixty samples of untreated and 20 of treated water were probed by RT-PCR. RESULTS: Six samples were positive for rotavirus and 2 for hepatitis A virus in both, treated and non treated water. DNA sequence analysis identified the presence of human G2 rotavirus and human hepatitis A virus. CONCLUSION: The evidence indicated a high level of contamination with pathogenic viruses in consumable water sources in Quibdo, Colombia.

INTRODUCTION: Although the transfusion of blood products is a common therapy, it carries risk of transmission of infections, especially hepatitis B virus (HBV) and human immunodeficiency virus (HIV). OBJECTIVE: As part of the blood safety initiative, the Pan American Health Organization supported studies to estimate the prevalence of human immunodeficiency virus and hepatitis B virus infection in Colombia. MATERIALS AND METHODS: Between February and September 2003, a cross sectional study examined 500 multiply-transfused patients at four hospital centers in the cities of Bogota and Medellin. The serum samples were analyzed by enzyme immunoassay (EIA) using commercial kits. RESULTS: The seroprevalence of HIV infection was 1.8% (CI 95% 0.5-3.1). The seroprevalence of HBV infection was 18.6% (CI 95% 15.1-22.1). Six risk factors were associated with HIV and HBV infection: (1) receiving more than 48 units of blood or blood components, (2) diagnosis of hemophilia, (3) receiving transfusions for more than one year, (4) receiving whole blood, (5) coinfection with hepatitis C virus and (6) receiving transfusions before 1993. CONCLUSIONS: This is the first epidemiological study with a significant sample size performed in multiply-transfused patients in Colombia. The principal finding was the high prevalence of HBV and HIV infection in patients with diagnosis of hemophilia compared with the other five groups of multiply-transfused patients.

INTRODUCTION: Although the transfusion of blood products is a common therapy, it carries risk of transmission of infections, especially hepatitis B virus (HBV) and human immunodeficiency virus (HIV). OBJECTIVE: As part of the blood safety initiative, the Pan American Health Organization supported studies to estimate the prevalence of human immunodeficiency virus and hepatitis B virus infection in Colombia. MATERIALS AND METHODS: Between February and September 2003, a cross sectional study examined 500 multiply-transfused patients at four hospital centers in the cities of Bogota and Medellin. The serum samples were analyzed by enzyme immunoassay (EIA) using commercial kits. RESULTS: The seroprevalence of HIV infection was 1.8% (CI 95% 0.5-3.1). The seroprevalence of HBV infection was 18.6% (CI 95% 15.1-22.1). Six risk factors were associated with HIV and HBV infection: (1) receiving more than 48 units of blood or blood components, (2) diagnosis of hemophilia, (3) receiving transfusions for more than one year, (4) receiving whole blood, (5) coinfection with hepatitis C virus and (6) receiving transfusions before 1993. CONCLUSIONS: This is the first epidemiological study with a significant sample size performed in multiply-transfused patients in Colombia. The principal finding was the high prevalence of HBV and HIV infection in patients with diagnosis of hemophilia compared with the other five groups of multiply-transfused patients.

INTRODUCTION: Although the transfusion of blood products is a common therapy, it carries risk of transmission of infections, especially hepatitis B virus (HBV) and human immunodeficiency virus (HIV). OBJECTIVE: As part of the blood safety initiative, the Pan American Health Organization supported studies to estimate the prevalence of human immunodeficiency virus and hepatitis B virus infection in Colombia. MATERIALS AND METHODS: Between February and September 2003, a cross sectional study examined 500 multiply-transfused patients at four hospital centers in the cities of Bogota and Medellin. The serum samples were analyzed by enzyme immunoassay (EIA) using commercial kits. RESULTS: The seroprevalence of HIV infection was 1.8% (CI 95% 0.5-3.1). The seroprevalence of HBV infection was 18.6% (CI 95% 15.1-22.1). Six risk factors were associated with HIV and HBV infection: (1) receiving more than 48 units of blood or blood components, (2) diagnosis of hemophilia, (3) receiving transfusions for more than one year, (4) receiving whole blood, (5) coinfection with hepatitis C virus and (6) receiving transfusions before 1993. CONCLUSIONS: This is the first epidemiological study with a significant sample size performed in multiply-transfused patients in Colombia. The principal finding was the high prevalence of HBV and HIV infection in patients with diagnosis of hemophilia compared with the other five groups of multiply-transfused patients.
selected for the study using one-stage cluster sampling (N=2145) and were examined for HBV serological markers and antibodies against surface antigen (anti-HBs). RESULTS: There has been a reduction of 60-75% in the prevalence of HBV infection and hepatitis B surface antigen (HBsAg) carriage since HBV vaccination was introduced. Receiving the first dose of HBV vaccine at more than two months after birth was one of the factors associated with HBV carrier status. Maternal HBV infection was also associated with infection in the child. CONCLUSIONS: The recombinant Cuban hepatitis B vaccine has contributed to the reduction of the infection in this highly endemic area, though further efforts are required to improve timely vaccination for children at high risk.


INTRODUCTION: STDs are a significant cause of illness throughout the world. Female sex workers (FSWs) are commonly perceived as belonging to a social group which may engage in high-risk behaviour for acquiring or transmitting HIV and other STDs. The number of immigrant women engaged in sex work has increased in Catania, Sicily, over the last 10 years. This study aims to estimate the prevalence of HIV, HBV, HCV and syphilis among Colombian and Dominican FSWs. METHODS: In total 118 (63.78%) of the FSWs contacted in the course of the project agreed to participate in the study. All women enrolled were counselled on STDs/HIV, safer sex practices and the use of condoms. Blood samples were taken and tested for HIV, HBV, HCV and syphilis. RESULTS: Of the 118 FSWs enrolled, all were negative for both HIV and HCV infection. Two women (1.6%) were positive for hepatitis B (HBsAg). Syphilis testing by VDRL showed three positive results (2.5%), which was confirmed by TPHA.

DISCUSSION: This study showed that HIV, HBV, HCV and syphilis seroprevalence among Colombian and Dominican FSWs remains low or very rare. It also indicates that these women were healthy when they arrived in Italy and that condom use with clients is high.


Both hepatitis B and hepatitis C viruses (HBV and HCV) infection are common in HIV-infected individuals as a result of shared risk factors for acquisition. A serological study for HBV and HCV was performed in 251 HIV-positive individuals from Medellin, Colombia. A qualitative RT-PCR for HCV was done in 90 patients with CD4+ T-cell count < 150 per mm(3). Serological markers for HBV infection were present in 97 (38.6%) patients. Thirty-six of them (37.1%) had isolated anti-HBc. A multivariate analysis indicated that the following risk factors were significantly associated with the presence of these markers: age (OR = 1.05, 95% CI: 1.01-1.08), pediculosis pubis (OR = 1.83, 95% CI: 1.01-3.33), men who have sex with men and women (OR = 3.23, 95% CI: 1.46-7.13) and men who have sex only with men (OR = 3.73, 95% CI: 1.58-8.78). The same analysis restricted to women showed syphilis as the only significant risk factor. Thus, HBV infection was considerably associated with high risk sexual behavior. HCV was present in only two (0.8%) of HIV patients. Both of them were positive by RT-PCR and anti-HCV. This low frequency of HIV/HCV coinfection was probably due to the uncommon intravenous drug abuse in this population. The frequent finding of isolated anti-HBc warrants molecular approaches to rule out the presence of cryptic HBV infection.


Shen-Min is a herbal product sold as a supplement for women to enhance hair growth. It is widely available across Asia, Europe, and the United States and sold without prescription as a hair nutritional supplement. We describe a case of acute liver injury in a 28-year-old white woman who developed symptomatic hepatitis 8 weeks after starting Shen-Min. All other potential causes of acute hepatitis including viral, hypoxic/ischemic, metabolic, and autoimmune etiologies were excluded. The liver injury slowly resolved over 3 weeks after discontinuing the herbal product. Although the mechanism of Shen-Min hepatotoxicity is unknown, we suspect an idiosyncratic autoimmune etiology because the patient developed a fine maculopapular rash, mild eosinophilia, and did not overdose. Shen-Min is a Chinese herbal product with a mixture of several plants and vitamins including Polygonum multiflorum, a root that has been previously associated with hepatotoxicity. Nonetheless to our knowledge this is the first reported case of herbal-induced hepatotoxicity in a patient taking Shen-Min per se. Clinicians taking care of patients with acute hepatitis of unclear etiology should be aware that the consumption of Shen-Min, a hair supplement widely available in the United States and Western countries might cause acute hepatitis.


OBJECTIVE: Identifying inequity in childhood vaccination coverage in towns throughout Colombia for both immunisations scheme and type of vaccine. METHODS: An ecological study using secondary information for 2000 and 2003. Three indicators were measured: (1) gaps in coverage (understood as being the differences between municipal coverage and that at national level), (2) Gini coefficient and (3) Lorenz’s curve. RESULTS: Decreasing
national vaccination coverage was found, dropping from 78.8% in 2000 to 66.8% in 2003. The number of towns having gaps in their coverage also increased during the two years being studied. Vaccination coverage concentration coefficients and curves showed inequalities between the municipalities during the two years being studied, although Gini coefficients improved from 0.18 to 0.13 for vaccination coverage between 2000 and 2003. The anti-influenza vaccine had the greatest decrease in inequality during the years being studied, followed by the anti-hepatitis B vaccine. The smallest change was recorded for the tuberculosis vaccine (BCG). Poliovirus vaccine estimations lay between those for BCG and hepatitis B. CONCLUSIONS: Action should be focused on municipalities identified as having recurring low coverage and large gaps compared to the national level.


OBJECTIVES: We conducted a vaccination coverage survey in the Colombian Amazon, an area highly endemic for hepatitis B (HB), where HB vaccine was introduced in 1992. The aim was to measure vaccine coverage and factors influencing it, especially those related to health services. METHODS: A total of 3573 children younger than 11 years were randomly selected from four populations. Vaccination status was ascertained through the vaccination card and a questionnaire on socio-demographic factors was applied to children’s caretakers. Health workers (HW) in charge of vaccination in rural and urban areas were interviewed regarding knowledge and practices in vaccination. Individual and HW characteristics were related to individual vaccination using logistic regression. RESULTS: Overall cumulated vaccination coverage was high for polio (96%, 95% CI: 94-98), measles (94%, 95% CI: 92.8-95.2), BCG (91%, 95% CI: 90-93), DPT (90%, 95% CI: 88-92) and HB (88%, 95% CI: 86-90). However, <50% of children completed the primary course of vaccination in the first year of life. Individual factors improving the likelihood of being either fully or HB vaccinated were: age>1 year, living in Leticia, being affiliated to the social security, and living in a house with a roof made of tiles rather than palm tree leaf. Among the variables related to HWs, poor knowledge of vaccine contraindications predicted a lower chance of being fully or HB vaccinated in the population served by them, even after controlling for individual variables. CONCLUSIONS: The HB control program in Colombia has achieved good coverage in one of the most endemic areas of the country. However, barriers to vaccination arise from inequities in the distribution of health insurance and inadequate HW knowledge.


BACKGROUND: Hepatitis C Virus (HCV) infection is a public health problem worldwide, with particular relevance in multi-transfused patients given that HCV is principally transmitted by exposure to infected blood. STUDY DESIGN: Between February and September 2003 a cross-sectional study was carried out in four hospital centres in Bogota and Medellin, Colombia, to determine the risk factors for HCV infection in 500 multi-transfused patients. RESULTS: The study population was distributed in five groups: haemophilia, haemodyalysis, acute bleeding, ontological illnesses and sickle cell disease or thalassemia. Serum samples from patients were tested for HCV antibodies (Asxym, Abbott). An overall prevalence (9.0%; 95% confidence interval (CI): 6.4-11.6) (45/500) of HCV infection was found. Anti-HCV antibodies were detected in 32.2% of patients with haemophilia, 6.1% of patients undergoing haemodialysis, 7.1% of patients with sickle cell disease or thalassemia, 2.6% of patients with acute bleeding and 3.4% of patients with ontological or hematological diseases. The main risk factors associated with infection by HCV were: to be hemophilic (odds ratio, OR = 18.03; 95% CI: 3.96-114.17), having received transfusions before 1995 (OR = 12.27; 95% CI: 5.57-27.69), and having received more than 48 units of blood components (OR = 6.08; 95% CI: 3.06-12.1). In the multivariate analysis, only the year of transfusions (before 1995) remained significantly associated with risk of infection by HCV. CONCLUSIONS: The data show a 3-fold reduction in the infection risk between 1993 and 1995, when the serological screening for HCV in blood donors was being introduced. A reduction greater than 90% was achieved by 1995 when the screening coverage reached 99%.
2.5 Hepatitis in Costa Rica

Pubmed MEDLINE search on on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Costa Rica) NOT autoimmune in all fields, filter (since 10year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Costa Rica were selected. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.


Haemophilia is the most frequent hereditary haemorrhagic illness and it is due to the deficiency of coagulation factors VIII (haemophilia A, HA) or IX (haemophilia B, HB). The prevalence of this disease varies according to the country, those having better survival rates having also higher prevalences. Specifically in Costa Rica, there are around 130 HA and 30 HB families. This study reports the prevalence and a spatial distribution analysis of both types of the disease in this country. The prevalence of haemophilia in this country is 7 cases per 100000 men, for HA it is 6 cases per 100000 and for HB it is 1 case per 100000 male inhabitants. The prevalence of this disease is low when compared with other populations. This low prevalence could be due to the many patients that have died because of infection with human immunodeficiency virus during the 1980s. The prevalence of haemophilia in Costa Rica is almost one half of that present in developed countries. Nevertheless, the ratio between HA and HB follows world tendency: 5:1. In this study, nationwide geographical distribution maps were drawn in order to visualize the origin of severe cases and how this influences the pattern of distribution for both types of haemophilia. By means of these maps, it was possible to state that there is no association between the sites of maximum prevalence of mutated alleles and ethnicity. With this study, haemophilia prevalence distribution maps can be used to improve efforts for the establishment of hemophilia clinics or specialized health centers in those areas which hold the highest prevalences in this country. Also, this knowledge can be applied to improve treatment skills and offer the possibility of developing focused genetic counseling for these populations.


Although swine HEV isolates from North America, Europe, and Asia have been genetically characterized, little is known about the strains presumed to be circulating in Latin America. In this study, seven commercial swine production sites in Costa Rica were surveyed for HEV. Using RT-PCR, with primers located in ORF2, 19/52 fecal samples produced a product of the expected size following two rounds of amplification. Most positive samples were from swine between the ages of 1.5 and 4 months. This study provides documented evidence for the endemcity of HE infections in swine residing in Central America. Through nucleic acid sequencing, isolates were found to be genetically similar, if not identical, with no amino acid substitution. By comparison of swine and human HEV strains representing all four genotypes and phylogenetic analysis, our isolates closely resembled the US swine and human and other Genotype III strains, with 85-93% nucleic acid identity.


BACKGROUND: Around 400 million people worldwide are chronically infected with Hepatitis B virus (HBV). An estimated 10% of these chronic patients develop progressive liver damage including cirrhosis and Hepatocellular Carcinoma (HCC). The HBx gene encodes a protein of 154 amino acids which is a transactivator and has been associated with HBV pathogenesis. A change in the amino acid sequences at positions 130 and 131 in the HBV-X protein (M130K and V131I) produced by T-A point mutations at the nucleic acids level has been associated with severe liver damage and HCC in patients from China and Africa. Further, such changes have been proposed as a prognostic marker for progressive liver damage and HCC. The purpose of this study was to determine if T-A mutations are present in HBV chronic carriers with genotype F (the major genotype in Costa Rica) and further, if these mutations are associated with HBV disease progression in Costa Rica HBV patients from 1972 to 1985. RESULTS: Serum samples from 50 HBV positive individuals were amplified and directly sequenced, 48 belonged to genotype F, 1 from genotype D and another was classified as D or E. T-A mutations were absent in 17 acute patients who recovered, but was present in 12 of 29 chronic carrier samples (42.8%), in one sample the T-A mutations were detected as early as 29 days after clinical onset of disease. In 17 carriers with available liver
biopsies, T-A mutations were found in 8 sera of 13 (61.5%) classified as moderate or severe, and none in 4 biopsies with mild liver damage. However, it was not possible to demonstrate a statistical association between the presence of T-A mutations and moderate/severe liver damage, using a Fischer exact test, 1 tail, p = 0.05. In 4 patients HCC was diagnosed, and 2 of them presented the T-A mutations in their sera. CONCLUSION: T-A mutations were found in HBV genotype F in chronic carriers but not in patients who recovered from acute infection. These mutations could be developing early during infection although the possibility of infection with the mutant virus could not be excluded. More studies are necessary to establish if the T-A mutation can be used as a prognostic marker for severity of liver disease in patients infected with HBV.

2.6 Hepatitis in Ecuador

Pubmed MEDLINE search on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Ecuador) NOT autoimmune } in all fields, filter (since 10year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Ecuador (not British Columbia) were selected. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.


Dengue virus is one of the most common known causes of arboviral disease. Classic dengue fever (DF) is rarely fatal, but it may be incapacitating and require hospitalization. Atypical forms have been described involving the cardiac system, the central nervous system, and the hepatobiliary system. A 47-year-old white man returning from Ecuador presented with daily fevers, headaches, myalgias, vomiting, and no abnormal physical examination findings. His laboratory findings were notable for transaminitis and elevated DF convalescence titers. He was subsequently diagnosed with DF. This case is somewhat atypical because a literature search revealed no cases of transaminitis with classic DF in Central America with the same particular pattern as in this patient. Given the increase in global travel, an increase in DF with a wide range of organ involvement among those returning to the United States from endemic areas should be expected.


RNA editing by the host RNA adenosine deaminase ADAR1 at the amber/W site of hepatitis delta virus RNA plays a central role in the viral replication cycle by affecting the balance between viral RNA synthesis and packaging. Previously, we found that HDV genotype III (HDV-3) RNA can form two secondary structures following transcription: an unbranched rod structure, which is characteristic of HDV, and a metastable branched structure that serves as the substrate for editing. The unstable nature of the branched editing substrate structure raised the possibility that structural dynamics of the RNA following transcription could determine the rate at which editing occurs. Here, editing and its control are examined in two HDV-3 isolates, from Peru and Ecuador. Analysis of editing in vitro by ADAR1 indicated that the branched structure formed by RNA derived from the Peruvian isolate is edited more efficiently than that from the Ecuadorian isolate. In contrast, in the context of replication, Peruvian RNA is edited less efficiently than RNA containing Ecuadorian sequences. Computational analyses of RNA folding using the massively parallel genetic algorithm (MPGAfold) indicated that the Peruvian RNA is less likely to form the branched structure required for editing than the Ecuadorian isolate. This difference was confirmed by in vitro transcription of these RNAs. Overall, our data indicate that HDV-3 controls RNA editing levels via (1) the fraction of the RNA that folds, during transcription, into the metastable branched structure required for editing and (2) the efficiency with which ADAR1 edits this branched substrate RNA.


BACKGROUND: The Ecuadorian National Blood System collects approximately 100 000 units of blood per year. Screening for infectious agents is conducted by 23 autonomous blood services using different methodologies and reagents. OBJECTIVES: To evaluate the performance of serology testing by laboratories of the Ecuadorian National
Blood Bank System. STUDY DESIGN: Four proficiency panels were distributed between April 2003 and December 2004 containing samples that were characterized as either reactive or non-reactive for hepatitis B surface antigen (HBsAg), antibodies against hepatitis C virus (HCV), and antibodies against human immunodeficiency virus (HIV). Laboratories were classified according to the volume of blood units processed per year, as small (<5000), medium (5000-12000) and large (>12000). RESULTS: Large and medium blood services consistently obtained better results than small ones. All of the 37 anti-HIV antibody false negative results and all of the 20 HBsAg false negative results were reported by small laboratories. False negative results were associated with the use of rapid tests. Laboratories using rapid tests and certain lots of an enzyme-linked immunosorbent assay (ELISA) failed to detect HCV reactive sera in December 2004. CONCLUSION: The high number of incorrect results in most small blood services indicates serious weaknesses in blood screening that require urgent corrective action. The National Blood System has implemented on-site audits, training, technical assistance, and increased oversight. The long-term proposal is to centralize blood testing in two large blood centers. The results presented here underline the importance of strengthening the regulatory framework and oversight in Ecuador and highlight the role of external performance evaluation programs for blood safety improvement.

2.7 Hepatitis in Paraguay

Pubmed MEDLINE search on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Paraguay) NOT autoimmune } in all fields, filter (since 10year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Paraguay (not British Columbia) were selected. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.
2.8 Hepatitis in Peru

Pubmed MEDLINE search on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Peru) NOT autoimmune in all fields, filter (since 5 year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Peru were selected. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.


OBJECTIVE: To assess the seroprevalence of hepatitis B virus (HBV), syphilis, and HIV and associated risk factors in pregnant women and their male partners from six indigenous populations of the Peruvian Amazon Basin. METHODS: A cross-sectional study was performed in six indigenous populations from the Peruvian Amazon Basin. Blood samples were obtained and tested for HBV (antibodies to the hepatitis B core antigen (anti-HBc) and hepatitis B surface antigen (HBsAg)), for syphilis (rapid plasma reagin and microhemagglutination assay for Treponema pallidum antibodies), and for HIV (ELISA and indirect immunofluorescence test). A survey was also performed to identify associated risk factors. RESULTS: One thousand two hundred and fifty-one pregnant women and 778 male partners were enrolled in the study. The seroprevalence of anti-HBc in pregnant women was 42.06% (95% confidence interval (CI) 39.28-44.85%) and in their male partners was 54.09% (95% CI 50.32-57.86%). The seroprevalence of HBsAg in pregnant women was 2.11% (95% CI 0.78-3.44%) and in their male partners was 3.98% (95% CI 1.87-6.08%). The seroprevalence of syphilis in pregnant women was 1.60% (95% CI 0.86-2.33%) and in their male partners was 2.44% (95% CI 1.22-3.66%). HIV seroprevalence in pregnant women was 0.16% (95% CI 0.02-0.58%) and in their male partners was 0.29% (95% CI 0.04-1.03%). Sexual risk factors were strongly related to blood markers of syphilis and HBV. CONCLUSIONS: Hepatitis B was found to be hyperendemic and strongly related to sexual factors, suggesting an important sexual component in the transmission of the disease in the populations studied. Syphilis was found to have an endemnicity in pregnant women above the national level and this may be indicative of high mother-to-child transmission. HIV has started to show its presence in indigenous populations of the Amazon Basin and the results suggest the epidemic is concentrated.


OBJECTIVES: To estimate the prevalence of antibodies against measles, rubella and hepatitis B in children aged between 1 and 4 years in Peru. MATERIALS AND METHODS: A national survey was conducted based on a questionnaire and capillary blood sample taken on filter paper in order to study antibodies against measles, rubella and hepatitis B in children from 1 to 4 years of age. A stratified, multistage, probability sampling design was used to be representative at the national level and at level of seven ambits, including the Metropolitan Lima Area, the rest of the urban coast, the rural coast, the rural highlands, the rural jungles, the urban jungle and the rural jungle. The capillary blood samples were processed according to the standardized protocols for detection of antibodies using the ELISA technique and commercial reagents. RESULTS: The survey showed a national prevalence of antibodies against measles, rubella and hepatitis B of 91.6% (CI 95%: 90.6%; 92.7%), 91.3% (CI 95%: 90.3%; 92.4%) and 95.9% (CI 95%: 95.0%; 96.8%) respectively. There was no evidence of significant differences in the prevalence among the ambits of study or among the socioeconomic strata of the conglomerates for any of the three types of antibodies. CONCLUSIONS: In children from 1 to 4 years of age, the national prevalence of antibodies against measles and Rubella was between 90-93%, while the prevalence of antibodies against Hepatitis B (anti-HBsAg) was between 95-97%.

A 45-year-old married man, with several sexual partners, initiated symptoms with nodosum erythema and in August 2008, is diagnosed of chronic hepatitis due to hepatitis B virus (HBV). Later he was diagnosed of Child A cirrhosis and hepatocarcinoma. He began HBV treatment with Entecavir 0.5 mg; then he underwent a V segment hepatectomy. In February 2009 he presented a relapse with a tumor of 14 mm on VI segment with AFP values of 68 ng/dl, so he underwent an ethanolization with good evolution. During the follow up, he has not presented evidence of relapse of hepatocarcinoma and continued with Entecavir 0.5 mg/d. In April 2010, after 72 weeks of therapy with good compliance, the patient presented a virological breakthrough (viral load 646 Ul/dl) and Tenofovir was added to his therapy. Nowadays the patient is receiving double therapy for HBV and his last viral load, April 2012, was negative. This could be the first case in our country of a probable resistance to Entecavir; complementary tests are needed in order to rule out this suspicion.


To determine the prevalence of serological markers of viral hepatitis B in university students of the city of Abancay, we performed a cross-sectional study on 240 students from three universities, from January to October 2010. Informed consent was requested to every student, an epidemiological record was filled, and a venous blood sample was drawn to determine the presence of HBsAg, total anti-HBcAg, anti-HBe, HBeAg and IgM Anti-HBc by ELISA. A prevalence of 2.5% (six positive samples) was found for HBsAg and of 28.3% (68 positive samples) for anti-HbcAg antibodies. The male sex was associated with the presence of anti-HBcAg (OR = 2.0, 95% CI, 1.2 to 3.6). We did not find HBeAg or IgM anti-HBc, however, the 6 HBsAg carriers were anti-HBe positive. In conclusion hepatitis B infection is still a public health problem in Abancay, with a significant prevalence in university students.


BACKGROUND: Data on hepatitis B virus (HBV) prevalence are limited in developing countries. There is also limited information of consistent condom use efficacy for reducing HBV transmission at the population level. The study goal was to evaluate the prevalence and factors associated with HBV infection in Peru, and the relationship between anti-HBc positivity and consistent condom use. METHODS AND FINDINGS: Data from two different surveys performed in 28 mid-sized Peruvian cities were analyzed. Participants aged 18-29 years were selected using a multistage cluster sampling. Information was collected through a validated two-part questionnaire. The first part (face-to-face) concerned demographic data, while the second part (self-administered using handheld computers) concerned sexual behavior. Hepatitis B core antibody (anti-HBc) was tested in 7,000 blood samples. Prevalences and associations were adjusted for sample strata, primary sampling units and population weights. Anti-HBc prevalence was 5.0% (95%CI 4.1%-5.9%), with the highest prevalence among jungle cities: 16.3% (95%CI 13.8%-19.1%). In the multivariable analysis, Anti-HBc positivity was directly associated with geographic region (highlands OR = 2.05; 95%CI 1.28-3.27, and jungle OR = 4.86; 95%CI 3.05-7.74; compared to coastal region); and inversely associated with age at sexual debut (OR = 0.90; 95%CI 0.85-0.97). Consistent condom use, evaluated in about 40% of participants, was associated with reduced prevalence (OR = 0.34; 95%CI 0.15-0.79) after adjusting for gender, geographic region, education level, lifetime number of sex partners, age at sexual debut and year of survey. CONCLUSION: Residence in highlands or jungle cities is associated with higher anti-HBc prevalences, whereas increasing age at sexual debut were associated with lower prevalences. Consistent condom use was associated with decreased risk of anti-HBc. Findings from this study emphasize the need of primary prevention programs (vaccination) especially in the jungle population, and imply that condom use promotion might be a potential strategy to prevent HBV infection.


This guide sets out the technical criteria for the diagnosis and treatment of chronic hepatitis secondary to viral hepatitis B. The guide intend to reduce the morbidity and mortality of this disease. The Guide give practical definitions to help understand the terminology, describe epidemiology, risk factors, and clinical aspects and the diagnosis of chronic hepatitis B. Finally the guide give recommendations for the management including special circumstances such as patients with cirrhosis, patients coinfected with HIV or coinfected with hepatitis C. The recommendations of the guide become the national guide for the management of chronic hepatitis B

Hepatitis C is, at present, a worldwide health problem and is the most common cause of liver transplantation. Its prevalence in pregnant women is similar to that of the general population. In the absence of cirrhosis and portal hypertension, most HCV-infected pregnant women do not have obstetric complications. Screening of pregnant women that are asymptomatic and do not have risk factors is not cost effective. A high hepatitis C viral load reportedly increases vertical transmission and is higher in women who are coinfected with HIV or who are intravenous drug users. Prolonged rupture of the membrane for more than 6 h, amniocentesis, and perineal lacerations increase the potential risk of perinatal transmission. Although the hepatitis C virus can be transmitted intrapartum, prevention by caesarean delivery is not generally indicated. The HCV virus can be found in maternal milk; however, breast feeding is not contraindicated. In conclusion, there are no antiviral treatment recommendations for HCV-infected women during pregnancy, or guidelines for the prevention of vertical transmission.


Objective: To revise the available evidence on the cost-effectiveness of antiviral regimens for treatment of chronic hepatitis B. MATERIAL AND METHODS: We performed a systematic revision on MEDLINE, LILACS NICE and COCHRANE databases, searching for economic evaluations of antiviral regimens for treatment of chronic hepatitis B. We included original studies, systematic revisions and management guidelines including information on the cost-effectiveness of this treatment. We registered the characteristics and results of the retrieved documents.

Results: We obtained 29 original papers, 4 revision articles and 4 management guidelines. Most of these publications have been done in the last 5 years. There was conflict of interest in 73% of original articles, due to authors working for the pharmaceutical industry. 93% of articles that evaluate the cost-effectiveness of giving treatment for chronic hepatitis B against management of its complications find that it is indeed cost-effective to give antiviral treatment. 3/6 studies that evaluate lamivudine against other drugs find it as a dominant strategy, 3/5 find entecavir as the dominant strategy, 1/1 find tenofovir dominant, (1/4) find conventional interferon as dominant and none of them find adefovir or pegylated interferon as dominant strategies. CONCLUSIONS: We consider that the available evidence suggests that to give antiviral treatment for chronic hepatitis B is a cost-effective intervention for many health systems, including ours. It has varying indexes of cost-effectiveness according to the evaluated regimens. Ideally, we should perform local economic evaluations in this issue.


We describe two cases with acute hepatitis of patients who live at Lima, Peru and have a high socio-economic status. The first case is a 58 years old female with asthenia, jaundice, coluria and pruritus. The physical exam revealed jaundice and laboratory exams revealed transaminasemia (AST= 1754, ALT= 2680) and hyperbilirubinemia (total bilirubin= 7.98, direct bilirubin=7.03). Furthering serologic tests, revealed a positive test for anti-Hepatitis E virus IgM and IgG. All the symptoms were remitted by the 3rd week of disease. The second case described, is a 64 years old female with asthenia, hyporexia and abdominal pain, without jaundice. The physical exam was normal and initial laboratory tests revealed an AST= 2999 and ALT= 4370. All the symptoms were remitted by the 3rd week of disease. The ELISA testing for anti-Hepatitis E virus IgM, was positive. In both cases other viral hepatitis serologic tests were negative. We make a description of these 2 cases and a literature review, because these both, are the first cases of Hepatitis E described in our city, and for the relevance of this virus in current medical knowledge for patients with non A, non B, non C acute hepatitis.


Objective: To find and describe perceptions, beliefs, knowledge and attitudes adopted by healthy people regarding liver disease, who attend at three medical institutions. To estimate how the academic and socioeconomic level operate as determinant factors. MATERIAL AND METHODS: Descriptive transversal study that includes a 31 question-questionnaire made in a group of 390 healthy people who were in the waiting rooms at Hospital Cayetano Heredia (HNVCH), Policlinico Peruano Japones (PPJ) and Clinica Angloamericana (CAA), reflecting low, medium and medium-high socio economic status respectively. Data was processed with SPSS software.

Results: We found that 218/390 (56%) people had higher education level, and 64% were women. "Eating high-fat meals" had the highest percentage (91%) among perceptions of liver disease. "Bad breath" and "heartburn" were referred as symptoms of liver disease, among people with a higher education level. Less than 50% of people knew about routes of transmission of hepatitis B, associated with its prevention and treatment. CONCLUSIONS: Beliefs and wrong perceptions about liver disease are prevalent among people; dyspepsia was inaccurately associated. There is an inappropriate knowledge about routes of transmission, preventive measures and treatment, which was reflected in people with lower education level as well as in those with higher education and socioeconomic level.

To assess the epidemiology of hepatitis B virus (HBV) infection among men who have sex with men (MSM) in Peru, we evaluated the prevalence and associated risk factors for HBV serologic markers among participants of a HIV sentinel surveillance conducted in 2002-2003. The standardized prevalences for total antibodies to hepatitis B core antigen (anti-HBc) and hepatitis B surface antigen (HBsAg) were 20.2% and 2.8%, respectively. Individuals with human immunodeficiency virus (HIV-1) infection had significantly higher anti-HBc (44.3% versus 19.3%) and HBsAg (9.5% versus 2.3%) prevalences than uninfected men. Increasing age (adjusted odds ratio [AOR] = 1.06), versatile sexual role (AOR = 1.59), sex in exchange for money/gifts (AOR = 1.58), syphilis (AOR = 1.74), HIV-1 infection (AOR = 1.64), and herpes simplex virus type 2 (HSV-2, AOR = 2.77) infection were independently associated with anti-HBc positivity, whereas only HIV-1 infection (AOR = 3.51) and generalized lymph node enlargement (AOR = 3.72) were associated with HBsAg positivity. Pre-existing HBV infection is very common among Peruvian MSM and was correlated with sexual risk factors. MSM in Peru constitute a target population for further HBV preventive and treatment interventions.


OBJECTIVE: To determine the prevalence of communicable diseases, mental health and environmental pollutants exposure in population living near Las Bambas mining project before exploitation phase. MATERIAL AND METHODS: Cross sectional study performed in 453 subjects (children and adults) living in three Apurimac region districts: Haquirá, Chalhuhuacho and Progreso. Psychomotor development, intelligence quotient, anxiety and depression levels and the presence of communicable diseases (viral hepatitis B, C and delta, syphilis and HIV) were evaluated, as well as heavy metals (lead in blood, and cadmium, arsenic and mercury in urine samples) and serum cholinesterase levels. RESULTS: Mean age was 29 +/- 17.25 years, 59.2% were female and a range of 6 to 15 years of living in the area was found. No cases of HIV, hepatitis C and delta were found. 1.4% were positive for syphilis and in relation to hepatitis B, we found 1.7% of subjects positive to total anti Hbc and 0.5% positive for HBsAg. Heavy metal testing identified people with exceeding limits of mercury in 1.8% arsenic in 4.6%, lead in 24.3% and cadmium in 43.9%. Besides, 29.1% of the population had cholinesterase levels below normal range. Among children, 12.5% were at psychomotor development levels of risk; 2.1% and 3.1% suffered from mild and borderline intellectual disability (mental retardation), respectively. 34.3% of subjects older than 12 had anxiety and 17.5% depression. CONCLUSIONS: Evidence of heavy metal environmental pollution and presence of communicable diseases in this population were already found. Future careless mining activity could worsen the current health situation.


Hepatitis C virus (HCV) infection occurs among human immunodeficiency virus (HIV)-infected men who have sex with men (MSM) because of shared routes of transmission. To assess the association between HCV and HIV infection among MSM in Peru, we conducted a matched case-control study (162 HIV-positive cases and 324 HIV-negative controls) among participants of an HIV sentinel surveillance survey in six urban cities. The HCV infection was initially screened using anti-HCV ELISA and immunoblot assay, and thereafter confirmed by the HCV RNA qualitative assay. Among cases, no confirmed HCV infection was found while among controls, only two confirmed HCV infections were reported (0.62%). This matched case-control reports a very low probability of association between HCV and HIV co-infection and suggests a very low prevalence of HCV infection among MSM in Peru.


Hepatocellular carcinoma (CHC) is one of the leading causes of worldwide cancer mortality. The aim of this study is to describe the clinical and epidemiological characteristics, as well as treatment prescribed in patients with this diagnosis. METHODS: Longitudinal and prospective study that included patients with diagnosis of CHC in the Department of Digestive System at the HNERM-EsSalud between August 2007 and August 2008. RESULTS: We included 36 patients, median age was 60.1 years and 61.1% were male. Cirrhosis was present in 69.1% and median age in this group was 68.9 years, the median age in those without cirrhosis was 40 years (p<0,001). The most frequent associated cause was hepatitis B (38.9%) and 60% had AFP higher than 200 ng/mL. In cirrhotic patients, 80% were Child-Pugh score B or C. Symptomatic treatment was prescribed in 44.4% of the patients.
CONCLUSIONS: Epidemiological features are different between patients with or without cirrhosis. In the first case their characteristics are similar to those described in areas of low risk for CHC; in the second group the characteristics are similar to those described in areas with high risk population. CHC has frequent association with hepatitis B virus. High percentage of patients is diagnosed with an advanced stage of HCC.

2.9 Hepatitis in Uruguay

Pubmed MEDLINE search on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Uruguay) NOT autoimmune } in all fields, filter (since 10year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Uruguay were selected. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.


In developing countries, hepatitis E virus (HEV) infection is a public-health concern because it causes epidemics and waterborne outbreaks. In South America, few HEV strains have been characterized at the molecular level. We report the detection and molecular analysis of the first set of sporadic cases of autochthonous human genotype 3 HEV infection in Uruguay.


The aim was to determine whether the immunogenicity of an investigational hepatitis B vaccine (spHB) is at least as high as that of a licensed control vaccine, Engerix B, and to evaluate its safety before inclusion in new pediatric combination vaccines. Two randomized, controlled, blind-observer, Phase 3 trials were performed: one in Argentina (344 participants aged 10-15 years, 10 microg HbsAg/dose) and one in Uruguay (344 participants aged 16-45 years, 20 microg HbsAg/dose). Both vaccines were given in a 0, 1, 6 month schedule to all participants with a baseline anti-Hep B antibody titer <0.6 mIU/mL. Antibody titers were measured pre-dose 1, 1 month after dose 2, pre-dose 3, and 1 month after dose 3. Statistical non-inferiority analyses were performed on seroprotection rates (SP) post-dose 3 (% with anti-Hep B titers >or=10 mIU/mL; delta non-inferiority limit of -10%). In both studies, SP for the spHB vaccine was 100% and the spHB vaccine was non-inferior in terms of SP to the licensed control vaccine. GMTs post-dose 3 were approximately 1.8- and 4.1-fold higher for spHB in the 10-15 year and 16-45 year age groups, respectively. Reactogenicity was low for each vaccine, after each dose. This highly immunogenic hepatitis B candidate vaccine was selected for further investigation as a component of new pediatric combination vaccines.


Hepatitis A virus (HAV), the causative agent of type A viral hepatitis, was first identified about three decades ago. Recent findings have shown that HAV possess several characteristics that make it unique among the family Picornaviridae, particularly in terms of its mechanisms of polyprotein processing and virion morphogenesis. HAV circulates in vivo as distributions of closely genetically related variants referred to as quasispecies. HAV exploits all known mechanisms of genetic variation to ensure its survival, including mutation and recombination. Only one serotype and six different genetic groups (three humans and three simian) have been described. HAV mutation rate is significantly lower as compared to other members of the family Picornaviridae. The mode of evolution appears, at least in part, to contribute to the presence of only one known serotype.

Coitinho, C., Marroche, D. and Toscanini, C. "Is it necessary to investigate anti-hepatitis A virus (HAV) IgM antibodies

Is it necessary to investigate anti-hepatitis A virus (HAV) IgM antibodies when the hepatic enzymogram is normal? Type A viral Hepatitis (HAV) is the most frequent viral hepatitis around the world, especially in low income countries. In order to confirm this disease, a lot of laboratory tests are annually carried out where HAV is endemic. Our objective was to establish the utility of investigating anti-hepatitis A virus (HAV) IgM antibodies for HAV diagnosis in patients with normal levels of serum aspartate and alanine aminotransferases (AST/ALT). All patients (n = 158) received in the laboratory requesting a hepatic enzymogram and anti-HAV IgM were evaluated in a prospective study between October 2005 and March 2006. Anti-HAV IgM assays were carried out by microparticle enzyme immunoassay (MEIA). The quantification of hepatic enzymes was made in a multianalyzer. The most frequent clinical data were: presumption of hepatitis and jaundice (27.5 and 12.7%). Eighty four of the 158 patients (53%) showed elevated values of ALT and AST, whereas 69 patients in this group (82%) were anti-Hav IgM reactive. The remaining 74 patients (47%) showed normal levels of AST/ALT and none of them were anti-HAV IgM reactive, except 7, who were on control of a confirmed HAV infection. Of the anti-HAV IgM reactive group of patients, 49% were children under 10 years of age. Laboratory HAV confirmatory tests would have to be made in sequential form, the determination of anti-HAV IgM antibodies being unnecessary when normal values of serum aminotransferases are observed.


BACKGROUND: In spite of the progress made in the prevention of transfusion-transmitted infections over the last years, these still occur. It was considered that infection by hepatitis B (HBV) and C (HCV) viruses could be a major problem in Uruguay, especially among high-risk individuals, such as multi-transfused patients. OBJECTIVES: To assess the prevalence of HBV and HCV infection among multi-transfused Uruguayan patients and the impact of serological screening; to evaluate the role of number of transfusions and other potential risk factors for the acquisition of HBV and HCV infection. STUDY DESIGN: Cross-sectional study of HCV antibodies, HBV surface antigen (HBsAg) and HBV core antibodies (HBcAc) in 409 multi-transfused patients. RESULTS: Of 409 patients studied, 147 (35.9%) received blood products due to acute bleeding, 118 (28.9%) were hemato-oncological, 75 (18.3%) hemophiliacs, 64 (15.6%) were on hemodialysis and 5 (1.2%) suffered sickle cell anemia. Prevalence of HBsAg was 1.0%; 16.6% of subjects were positive for HBcAc. The prevalence rates of HBcAc were 48.0%, 15.0% and 3.1% among hemophiliacs, 64 (15.6%) were on hemodialysis and 5 (1.2%) suffered sickle cell anemia. Prevalence of HCV antibody was 12.7%. Of the HCV positive patients, 45 were hemophiliacs, for a prevalence rate of 60.0%. The prevalence rates for hemodialysis and acute bleeding patients were 6.3% and 2.0%, respectively. Prevalence of HBsAg was 1.0%; 16.6% of subjects were positive for HBcAc. The prevalence rates of HBcAc were 48.0%, 15.0% and 3.1% among hemophiliacs, acute bleeding and hemodialysis patients, respectively. There was a direct relationship between the number of products transfused and prevalence of both hepatitis C antibodies and HBcAc. Higher prevalence of HCV and HBcAc was observed among the group of patients who received transfusions before the systematic screening of blood donors. CONCLUSIONS: Exposure to blood transfusions was the main risk factor for HCV and HBV infection. The systematic serological screening of blood donors was highly effective in reducing transfusion transmitted infections.

2.10 Hepatitis in Venezuela

Pubmed MEDLINE search on on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Venezuela) NOT autoimmune ; in all fields, filter (since 10year) was performed. After a manual search only the references and the abstracts really related to viral hepatitis and Venezuela were selected. The references are ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.


BACKGROUND: Recent reports show that R70Q and L/C91M amino acid substitutions in the core from different hepatitis C virus (HCV) genotypes have been associated with variable responses to interferon (IFN) and ribavirin (RBV) therapy, as well to an increase of hepatocellular carcinoma (HCC) risk, liver steatosis and insulin resistance (IR). Mutations in NS5B have also been associated to IFN, RBV, nucleoside and non-nucleoside inhibitors drug resistance. The prevalence of these mutations was studied in HCV RNA samples from chronically HCV-infected drug-naïve patients. METHODS: After amplification of core and NS5B region by nested-PCR, 12 substitutions were analyzed in 266 Venezuelan HCV isolates subtype 1a, 1b, 2a, 2c, 2b, 2j (a subtype frequently found in Venezuela) and 3a (n = 127 and n = 228 for core and NS5B respectively), and compared to isolates from other countries (n = 355 and n = 646 for core and NS5B respectively). RESULTS: R70Q and L/C91M core substitutions were present
BACKGROUND: Occult hepatitis B infection (OBI) is characterized by the presence of hepatitis B virus (HBV) DNA in the absence of HBsAg in the serum of patients. The aim of this study was to characterize HBV infection among a Piaroa community, an Amerindian group which exhibits significant evidence of exposure to HBV but relatively low prevalence of HBsAg, and to explore the presence of OBI in this population. RESULTS: Of 150 sera, 27% (41) were HBsAg positive and 73% (109) were negative. Of the remaining 109 sera tested, 23 exhibited OBI. Of these, 13 were HBsAg positive, indicating an overt infection. Of the remaining 68 sera tested, 23 exhibited OBI. Of these, 13 were HBsAg negative, with 25 anti-HBc positive (52%) and 10 HBV DNA positive, out of 43 anti-HBc negative (23%), with a statistical significance of p = 0.03. Viral DNA and HBsAg were present intermittently in follow up sera of 13 individuals. Sequence analysis in the core region of the amplified DNA products showed that all the strains belonged to HBV genotype F3. The OBI isolates displayed 96-100% nucleotide identity between them. One isolate exhibited the co-circulation of a wild type variant with a variant with a premature stop codon at the core protein, and a variant exhibiting a deletion of 28 amino acids. CONCLUSIONS: The frequency of OBI found in this Amerindian group warrants further studies in other communities exhibiting different degrees of HBV exposure.

BACKGROUND: The subtype diversity of the hepatitis C virus (HCV) genotypes is unknown in Venezuela.

METHODOLOGY/PRINCIPAL FINDINGS: Partial sequencing of the NS5B region was performed in 310 isolates circulating in patients from 1995 to 2007. In the samples collected between 2005 and 2007, HCV genotype 1 (G1) was the most common genotype (63%), composed as expected of mainly G1a and G1b. G2 was the second most common genotype (33%), being G2a almost absent and G2j the most frequent subtype. Sequence analysis of the core region confirmed the subtype assignment performed within the NS5B region in 63 isolates. The complete genome sequence of G2j was obtained. G2j has been described in France, Canada and Burkina Fasso, but it was not found in Martinique, where several subtypes of G2 circulate in the general population. Bayesian coalescence analysis indicated a most recent common ancestor (MRCA) of G2j around 1785, before the introduction of G1b (1869) and G1a (1922). While HCV G1a and G1b experienced a growth reduction since 1990, coincident with the time when blood testing was implemented in Venezuela, HCV G2j did not seem to reach growth equilibrium during this period. CONCLUSIONS/SIGNIFICANCE: Assuming the introduction of G2j from Africa during the slave trade, the high frequency of G2j found in Venezuela could suggest: 1- the introduction of African ethnic groups different from the ones introduced to Martinique or 2- the occurrence of a founder effect. This study represents an in-depth analysis of the subtype diversity of HCV in Venezuela, which is still unexplored in the Americas and deserves further studies.


OBJECTIVES: To report the prevalences of hepatitis B (HBV) and hepatitis D (HDV) infections in remote and more accessible Yanomami and Piaroa Venezuelan Amazonian Amerindian populations; to estimate incidence per susceptible. METHODS: Clinico-epidemiological evaluation was carried out in 9 Piaroa villages. Blood samples were tested for HBV core antibody (anti-HBc), surface antigen (HBsAg) and HDV antibody (anti-HDV). Results were analysed using logistic regression, and estimates made of HBV forces of infection (FOI). Prevalences and FOI were also estimated for 4 Yanomami villages. RESULTS: Mean Piaroa anti-HBc and HBsAg prevalences were 27.4% and 5.1%, respectively (up to 53% and 19% in the remote Autana region). Mean Yanomami anti-HBc and HBsAg prevalences were, respectively, 58.0% (range 43-70%) and 14.3% (31% in the village with highest HBsAg). No significant difference was found between sexes, with age and maternal HBsAg the only risk factors for HBV identified in multivariate regression of Piaroa data. Only 4 Piaroa and 2 Yanomami individuals were anti-HDV positive. CONCLUSION: Piaroa HBV prevalences were generally higher in remote villages than in less remote ones, with prevalences in Yanomami villages even higher. Anti-HBc prevalence was 47% in one Yanomami village with a history of HBV vaccination but no HBsAg cases were identified, suggestive of previously cleared or possibly transient infection or vaccine escape. Despite a past history of HDV epidemic outbreaks and HBsAg levels in some villages appearing sufficient to facilitate HDV transmission, anti-HDV prevalence was low; it remains to be established why no recent outbreaks have been reported.


Hepatitis B virus (HBV) has been classified into 8 genotypes (A-H). Genotypes A, D and F have been identified in some South American countries, but in Venezuela studies have been more restricted to aboriginal communities where genotype F is predominant. The aim of the present study was to identify the prevalence of HBV genotypes among native HBsAg carriers in Venezuelan urban areas. In addition, we correlated the predominant HBV genotype with epidemiological, serological and virological features of the infection. Non-Venezuelan migrant patients were excluded from this study. Serum samples from 90 patients (21 children and 69 adults) with chronic hepatitis B (CHB) were analyzed. Seventy-four patients had CHB e-antigen positive and 16 CHB e-antigen negative. HBV DNA serum levels of the whole group ranged from 4.1 to 8.8 log10 IU/mL. Patients with CHB e-antigen positive showed significantly higher viral loads (P = 0.0001) than the group with CHB e-antigen negative. Eighty-eight patients (97.8%) exhibited HBV genotype F while two non-related patients (2.2%) were infected with A + F genotypes. Genotype F is the main circulating HBV strain among HBsAg carriers from Venezuelan urban areas. This genotype is associated mostly with CHB e-antigen positive and high rate of transmission. Progression to cirrhosis and hepatocellular carcinoma could be major clinical events of this patient population independently of age at acquisition or transmission route.<br/>


INTRODUCTION: The high risk behaviors observed in prison centers have favored the transmission of hepatitis C.
virus infection. The main risk factor to acquire hepatitis C virus infection seems to be the use of intravenous drugs. In Venezuela, the prevalence of the infection in these centers is unknown since studies of the hepatitis C virus there are lacking. OBJECTIVE: The aim of this study was to determine the prevalence of hepatitis C virus and the risk factors involved in the transmission in prisoner populations. MATERIAL AND METHODS: A sample of 200 prisoners was studied from Sabaneta Jail, Maracaibo, Venezuela. The ages were between 18-69 years (average +/- DS: 31.6+/-.9.9 years). Serum samples were tested by a fourth generation enzyme-linked immunosorbent assay ELISA and a confirmatory assay INNO-LIA. Both kits were from Innogenetic Laboratories N.V. (Belgium). Viral RNA was tested by the reverse transcription polymerase chain reaction technique (RT-PCR). RESULTS: The ELISA assay determined a hepatitis C virus prevalence of 5.0% (10/200); 3/200 (1.5%) individuals were positive by both INNO-LIA and RT-PCR tests. CONCLUSIONS: The observed prevalence of hepatitis C virus antibodies in this population was very low, suggesting a low circulation of the virus in this environment and a low level of associated risk behaviors.


Molecular characterization of two sewage-borne pathogens identified hepatitis A virus (HAV) subgenotype IA and Giardia duodenalis assemblages A and B as predominant genotypes circulating in an urban area of Venezuela. This study reveals epidemiological features of human pathogens of worldwide distribution and the efficacy of molecular methods for accurate assessment of sewage pollution.


Once the elaboration of CIE-10 Gastroenterology we used two indicators (Health and Management) as quantifiable measurements that reflect the critical success factors in the specialty. HEALTH INDICATORS: MORBIDITY: 13.21% of main medical complains in primary care concern to Gastroenterology. Four of them rank among the first 25 ("Diarrhea", "Abdominal pain", "Helmintiasis" and "Other Esophagus, Stomach and Bowel diseases"). At the specialty care, Acid-peptic disease ranked as the first main complain according with 56-73.3% of the gastroenterologist consulted (Public and Private care) followed by Gastrointestinal reflux, Irritable bowel, Constipation, Lithiasis, Diverticular disease, Hemorrhages, Jaundice, Cirrhosis, Amibiasis, Pancreatitis, Colon cancer, Polyps, Hepatitis and Colopathy. MORTALITY: 11.4% of the total deaths among Venezuelans are by gastrointestinal causes and five of them count among the first 25, with wide regional variability. Trujillo reports major mortality by liver disease (3%) followed by Vargas, District Federal, Tachira (2.8%). Cirrhosis and Fibrosis are more frequent in Tachira (2.3%) Trujillo, Vargas (2.1%) Some regions report mainly infections and diarrheas. Major cancer mortality is in Tachira (6,73% of deaths in the State) followed by Merida and Trujillo. MANAGEMENT INDICATORS: Services Demand. 2.86 consult/habitant/year in internal medicine and 0.77 en specialties. Services Offer. 793 Gastroenterologists (3.4/10.000 habitants). 44.5% concentrated in D.Federal, followed by Tachira (3.9%) Carabobo, Zulia y Merida. Human Resources Formation. 16 Post-graduated Programs graduate 70 gastroenterologists annually. The Gastroenterology Education Agreement 2006 unified the Venezuelan Gastroenterologist profile and the graduation requirements. The Venezuelan Gastroenterology Society, age 60, has extraordinary national and international projection through its scientific publication (GEN Magazine). This analysis of the present of Gastroenterology in Venezuela allows us the strategically planning of its future, in order to satisfy the population needs in the specialty in a rational and effective way.


The aim of this study was to determine the prevalence of hepatitis B virus (HBV) infection in the Japreira indigenous community, Venezuela, and its relationship to age and gender. An intentional, non-probabilistic sample of 149 individuals was selected from a total of 300. All samples were studied for the presence of total HBV antibodies (total anti-HBc), and the positive samples were tested for HBV surface and "e" antigens (HBsAg, HBeAg). Overall prevalence rates of total anti-HBc were 72.9% in females and 81.1% in males. The highest prevalence of HBSAg was observed in males 26-35 years of age. Only four of the 44 HBSAg carriers were positive for HBeAg. The results showed a high endemic HBV infection rate and indicated that its spread begins at early ages. Sexual transmission may be the main route for spread of the virus. Crowding, close contact with bodily fluids, specific social practices, and features of the circulating viral strain among members of this community could be involved in the high chronicity observed in the Japreira indigenous community.


Objective: To determine the prevalence of HIV, Hepatitis B and syphilis amongst inmates during the time period 1998-2001. Materials and Methods: Descriptive, cross-sectional study carried out at 6 prisons using a volunteer sample of 1773 inmates. Blood samples were gathered and analysed using enzyme linked immunoassays (ELISA)
and RPR screening tests to identify the presence of HIV antibodies, Hepatitis B anti-core antibodies and treponema pallidum. Results: 456 cases gave a positive response to tests, 70 (4.0%,) of which gave positive results for HIV, 280 (16.2%) for Hepatitis B and 106 (6.1%) for syphilis. The greatest percentage of HIV cases were found amongst the youngest inmates (18 to 37 years). The number of Hepatitis B cases increased progressively in line with age until reaching a maximum percentage in the 48-57 age group. No significant statistical difference for age was observed in syphilis cases, but differences were found amongst HIV positive and Hepatitis B cases for age, length of sentence and number of prisons where inmate resided.


OBJECTIVE: The aim of this study was to establish the prevalence of hepatitis C virus infection in different populations at risk for infection. METHODS: This was a descriptive, transversal study whose variables were evaluated by Pearson's correlation analysis. Different populations were selected: 100 drug users, 47 sex workers, and 50 hemodialysis patients for a total of 197 individuals. The only inclusion criterion was the apparent risk of acquiring this viral infection. The presence of antibodies against virus was examined by ELISA IV (Innotest HCV Ab IV). Reactive samples were then tested using a recombinant assay (INNO-LIA HCV Ab III), both from Innogenetics N. V. (Belgium). The presence of viral RNA was determined in all ELISA and immunoblot-reactive samples by a nested polymerase chain reaction method (HCV-fast of Pharma Gen). RESULTS: A prevalence of 1% was found in drug users, and absence of infection or previous contact with the virus in sex workers and hemodialysis patients. CONCLUSIONS: This study shows a very low prevalence of infection with hepatitis C virus in populations at risk for acquiring the infection, and considered that this infection is not a public health problem in these populations in Maracaibo, Venezuela.


BACKGROUND: Changes in hepatitis C virus (HCV) genotype distribution with time have been reported in several countries. GOALS: To explore eventual changes in HCV genotype distribution in Venezuela over a 10 years period. STUDY: HCV genotype was determined by direct sequencing of the 5' non-coding region, in 236 isolates circulating in patients treated during years 2005 to 2006. Genotype distribution was compared with the one observed in 43 patients followed during years 1994 to 1996. RESULTS: The prevalence HCV genotype 1 and 2 was 70% and 26%, respectively, in patients followed during years 1994 to 1996. The frequency of genotype 2 was significantly increased to 41% (P=0.04) in patients treated during years 2005 to 2006. A significant reduction in HCV genotype 1b prevalence (48% to 27%, P=0.01) was also observed after this 10 years period, whereas the prevalence of HCV genotype 1a did not change over time (22% vs. 27%, NS). Transfusion was more significantly associated with infection with HCV genotype 1b than with other genotypes (52% vs. 20%, P=0.002). CONCLUSIONS: HCV subtype 1b seems to have been displaced by HCV genotype 2 in a relatively short period, without increase in the frequency of genotype 3. The low frequency of HCV genotype 3 in Venezuela might be due to the fact that intravenous drug use in Venezuela is less common than in other countries. The implementation of anti-HCV testing in blood banks since 1994 in Venezuela, might have contributed to the reduction in the frequency HCV genotype 1b infection.


Previous studies have not found hepatitis C virus (HCV) infection in Amerindians from Western Venezuela. A survey of 254 Bari and Yukpa natives aged 10-60 years (mean +/- SD age = 35 +/- 5.4 years) from four communities, two Bari and two Yukpa, in this area were studied to assess the prevalence of antibodies to HCV (anti-HCV) and HCV RNA among these indigenous populations. Serum samples were examined initially for anti-HCV by a four generation enzyme-linked immunosorbent assay (ELISA). Reactive samples were then tested using a third generation recombinant immunoblot assay (RIBA-3). Viral RNA was investigated in all immunoblot-reactive samples by a nested polymerase chain reaction (PCR) method. Six (2.3%) of 254 natives were positive by ELISA, one (2.2%) of these reactive samples were positive by RIBA, and four (1.5%) were indeterminate. Only two (0.8%) were positive by PCR, corresponding to 1 (2.1%) of 47 inhabitants of a Yukpa community and to 1 (2.2%) of 45 subjects of a Bari community. Intravenous drug use in Venezuela is less common than in other countries. The findings indicate a HCV focus of low endemicity and are compatible with a low degree of exposures of the natives to the virus. Studies are necessary to assess the risk factors for infection in these Amerindians.


Vaccination has demonstrated the capacity for the drastic decrease of the prevalence and incidence of several diseases of viral etiology and it has allowed their eradication. Among these human immuno preventable diseases are included poliomyelitis, measles, mumps, chicken pox, rubella, hepatitis A and B, influenza A and yellow fever. In residents, travelers to endemic areas and personal at risk, the vaccines to Japanese and equine encephalitis,
rabies and adenovirus can be applied. Venezuela has not escaped from the positive impact in the epidemiology of these illnesses as a consequence of the organization and implementation of big national vaccination campaigns; however, and in spite of these efforts, important outbreaks of measles, yellow fever, chicken pox and hepatitis have occurred in the last few years. The tools to eliminate the majority of these viral diseases exist in Venezuela as well as in other countries, and are readily available, effective and relatively not expensive, but require on the whole of an effort of authorities and communities. The implementation of these strategies should have the support of the World Health Organization and the Panamerican Health Organization. This is a priority for the next few years if our aim is the eradication of these illnesses from Venezuela, the continent and the world.

In November 2004, sponsored by the World Bank, the Venezuelan Foundation of Science, Technology and Innovation (Fonacit) and the Venezuelan Institute of Scientific Research (IVIC), delegates from the different virology research groups of the country, met in Caracas-Venezuela, with the aim to establish the "Venezuelan Virology Network". The symposium entitled "Molecular biology applied to virus of health importance in Venezuela", was divided into three areas, including human and animals viruses related to public health: 1) Dengue, others arboviruses and Hemorrhagic Fevers; 2) diarrhea-related and others veterinary viruses and 3) Hepatitis, HIV and others sexually transmitted viruses. This symposium allowed the delegates to evaluate the current strengths, weaknesses and needs of the different laboratories, becoming evident the necessity of developing collaborative work between the groups that share the same interests or lines of research; and also their need to exchange technical resources, human and bibliographical material and consequently, avoiding the duplication of efforts and the unnecessary cost of resources. One of the main strengths of Venezuelan virology is the presence, in most laboratories, of researchers with studies of fourth level and multidisciplinary teams of work. We aspire to achieve the raised objectives in the event, to the benefit of our virology and even more important, of our people.

Surface antigen negative hepatitis B virus (HBV) infection was evaluated in Venezuela, by molecular characterization of blood samples positive for antibodies to core antigen (anti-HBc) and negative for surface antigen (HBsAg) in blood donors (residual infections). HBV DNA was found in 11/258 samples (4.3%), and was significantly associated with high levels of anti-HBc antibodies (>25 UI/ml, P < 0.05), while no correlation was found between the presence of HBV DNA and the levels of anti-HBs. Synonymous and non-synonymous mutations were found in the HBV surface region (but not vaccine escape mutants) and in the precore/core region (precore mutants in 2/7 samples and 33-45 bp deletions near the N-terminal core region in 4/19 samples). While HBV genotype F prevails among HBsAg positive samples from blood donors in Venezuela, residual infection isolates were mainly genotypes A and D. Phylogenetic analysis of viral surface and core region revealed discrepancies in genotype designation in 6/9 samples, suggesting the presence of mixed infection or recombination. In conclusion, HBV residual infection in Venezuela does not seem to be frequently observed in HBV genotype F. This type of infection is frequently associated with variants exhibiting mutations in the surface gene that might be affecting the correct recognition by commercial tests, with precore mutants and with core internal deletions. These variants do not seem to cause severe liver disease, and on the contrary, were found circulating at low viremia.
PART III. Prevention and control of viral hepatitis in Brazil

3.1 . Brazil general background

Demographics information

The population of Brazil, as recorded by the 2008 PNAD, was approximately 190 million[22.31 inhabitants per square kilometre or 57.8/sq mi], with a ratio of men to women of 0.95:1 and 83.75% of the population defined as urban. The population is heavily concentrated in the Southeastern (79.8 million inhabitants) and Northeastern (53.5 million inhabitants) regions, while the two most extensive regions, the Center-West and the North, which together make up 64.12% of the Brazilian territory, have a total of only 29.1 million inhabitants.

Population growth: 0.83% (2013 est.)
Birth rate: 14.97 births/1,000 population (2013 est.)
Death rate: 6.51 deaths/1,000 population (2013 est.)
Net migration rate: -0.17 migrant(s)/1,000 population (2013 est.)
Sex ratio in total population: 0.98 male(s)/female (2013 est.)
Health expenditures: 8.9% of GDP (2011)
Physicians density: 1.76 physicians/1,000 population (2008)
Hospital bed density: 2.3 beds/1,000 population (2011)

Ethnic groups

- 47.73% White
- 43.13% Pardoa
- 7.61% Black
- 1.09% Asian
- 0.43% Amerindian
3.2 Burden of viral hepatitis in Brazil

Pubmed MEDLINE search on on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Brazil OR Brasil) NOT autoimmune in all fields, was performed. In End NOTE a second search was done on {Brazil AND Burden OR Carcinoma OR Transplantation} After a manual search only the references and the abstracts really related to the subject were selected and classified. The references ar ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.

BURDEN


Hepatocellular carcinoma is the fifth most common cancer in men and the seventh in women, as is diagnosed in more than half a million individuals worldwide every year. In Portugal, its incidence and mortality rates are low compared to other types of cancers. In Brazil, in the city of Sao Paulo, according to data released by the Brazilian Unified Health System (Sistema Unico de Saude - SUS), the incidence of primary liver cancer was 2.07/100,000 inhabitants. Although the vast majority of cases (85%) mainly affect developing countries, especially where infection by hepatitis B virus (HBV) is endemic, the incidence in developed countries is increasing. This pathology is associated with several risk factors, not only environmental but also genetic, generating an increasing interest in attaining a better understanding of this disease, which is still associated with very late diagnosis and poor prognosis. Of the available treatments, few patients benefit from their scanty advantages, increasingly stimulating research of new forms of treatment against this disease. This review aimed to briefly but fully identify risk factors, molecular and biochemical pathways, pathophysiology, diagnosis, and possible clinical approaches of hepatocellular carcinoma.


This descriptive study focused on the mortality profile associated with hepatitis B virus (HBV) in Brazil as a whole and by region, based on data from the Mortality Information System (MIS). The study sample consisted of deaths from HBV recorded in the MIS from January 1, 2000, to December 31, 2009. The crude mortality rate remained constant in the country; the proportion of hepatocellular carcinoma with HBV as the associated cause was no greater than 7%. The standardized mortality rate was highest in the North of Brazil, and the proportional mortality rate was higher in males. In 2009, the potential years of life lost (PYLL) were highest in males in the 50-59-year age bracket and in females in the 40-49-year bracket. The largest increase in PYLL occurred in males 60 to 69 years of age. The study emphasizes the importance of scaling up preventive measures against HBV, in addition to expanding access to early diagnosis in order to reduce HBV mortality in the coming decades.


Time trends in cancer incidence and mortality in the Western Amazon remain unknown. This study explored age-standardized cancer mortality rates according to anatomical site in Rio Branco, Acre State, Brazil, by constructing linear regression time trend models. Cancer mortality showed an increasing but inconstant trend in men and stability in women. At the end of the time series, the highest cancer rates among women were for the cervix, lung, liver and intrahepatic biliary tract, stomach, and breast. Among men, the highest rates were for cancer of the lung, prostate, liver and intra-hepatic biliary tract, stomach, and esophagus. The study showed an increasing mortality time trend for cancer of the prostate, breast, and lung and declining mortality rates for cervical cancer in women, lung cancer in men, and stomach cancer in both sexes. The high mortality rate from liver cancer merits attention, considering the high hepatitis B and C infection rates in the State of Acre.

Carcinoma and Transplantation


BACKGROUND: Liver transplantation is the main treatment option for hepatocellular carcinoma in patients with
cirrhosis. AIM: Three months and 3 years survival were analysed in patients with cirrhosis and hepatocellular carcinoma and in patients with only cirrhosis. METHODS: Charts of patients subjected to cadaveric liver transplantation at the Clinical Hospital of the Federal University of Parana, Curitiba, PR, Brazil, between January 5th of 2001 and February 17th of 2006 were reviewed. Patients were divided into two groups for 3 months and 1 year survival analysis: cirrhosis and hepatocellular carcinoma and cirrhosis only. The two groups were also compared in relation to donor and recipient sex and age, etiology of cirrhosis, Child-Pugh and MELD scores at the time of the transplantation, warm isquemia time, cold isquemia time, units of red blood cells transfused during the transplantation, intensive care unit stay and total hospital stay. RESULTS: One hundred and forty six liver transplantation patients were analysed: 75 were excluded because of incomplete data and 71 were included. General 3 months and 1 year survivals were 77.4% and 74.6% respectively. Patients with hepatocellular carcinoma (n = 12) presented 3 months and 1 year survivals of 100%. These rates were significantly higher than those of patients without hepatocellular carcinoma (n = 59; 72.8% and 69.4%). Mean MELD score, mean Child-Pugh score and mean number of red blood cells transfused were significantly higher in patients without hepatocellular carcinoma. In this group it was also observed more Child-Pugh B and C patients and the diagnosis of cirrhosis because other causes. The rate of Child-Pugh A and hepatitis C was higher in patients with hepatocellular carcinoma. The two groups were identical in all other parameters analysed. CONCLUSION: Patients with cirrhosis and hepatocellular carcinoma presented better 3 months and 1 year survival rates than patients with only cirrhosis. This is possibly due to an early stage of cirrhosis at transplantation of patients with hepatocellular carcinoma.


Chronic liver disease is a considerable burden on society, being one of the three main causes of death in certain regions of Africa and Asia. Liver transplant is the only treatment option for cirrhosis, which is the end stage of many chronic liver diseases. This article reviews the preventable causes of cirrhosis and the preventive strategies which could be implemented in order to avoid the catastrophic consequences of cirrhosis. With small variations around the world, 70 to 80% of the end stage liver diseases are caused by excessive alcohol consumption and by viral hepatitis, both of which are potentially preventable. Excessive alcohol consumption has important public health consequences because of its involvement not only with cirrhosis, but also with motor vehicle accidents, unemployment, domestic violence etc. Among the viral causes, Hepatitis Virus B and C have the greatest impact on public health. Effective vaccine is available for Hepatitis Virus B and must be put in use. While a vaccine for Hepatitis Virus C is awaited, effective preventive strategies should be undertaken to avoid the preventable cases of end stage liver disease.


Hepatitis C is the main cause of cirrhosis and hepatocellular carcinoma and the leading indication of liver transplantation. The aim of this article was to review specific epidemiological, clinical and therapeutic aspects of hepatitis C and their implication for the hepatologists belonging to liver transplantation services. These specific aspects were reviewed in the literature mainly using Medline. Data regarding the epidemiological, clinical and therapeutic aspects of hepatitis C are discussed, with emphasis on their consequences for the liver transplantation team. Hepatitis C is a challenge for hepatologists and for the liver transplantation team. The burden we observe today is the late consequence of infection that occurred in the past. Measures for early recognition of complications of liver disease are recommended. HCV treatment should always be performed before liver transplantation if possible, but if not, HCV recurrence should be recognized and treated early after transplantation.
3.3 Epidemiology of viral hepatitis in Brazil


BACKGROUND: Hepatitis B virus (HBV) and hepatitis D virus (HDV) represent important public health problems in the Western Amazon region with reported cases of fulminant hepatitis. This cross-sectional study describes HBV and HDV genotypes circulating in the Brazilian Amazon region. METHODS: HBsAg positive individuals (n = 224) were recruited in Manaus/Amazonas State (130 blood donors from the Hematology and Hemotherapy Foundation from Amazonas/HEMOAM; 60 subjects from outpatient clinics) and in Eirunepe city (n = 34) from 2003-2009. Most participants (n = 153) lived in Manaus, 63 were from 20 remote isolated municipalities, 8 lived outside Amazonas State. Genotyping was based on PCR products: HBV genotype A-F specific primers, restricted length polymorphism for HDV. HDV isolates were directly sequenced (delta antigen 405 nucleotide fragment) and phylogenetic analysis performed (MEGA; neighbor-joining, Kimura’s two parameter). RESULTS: Most participants were young adult males and HBV mono-infection predominated (70.5%, 158/224). Among blood donors, outpatient subjects and individuals from Eirunepe, HBV/A prevailed followed by HBV/D and F (p > 0.05). HBV/A was more frequent in blood donors (p < 0.05). HBV-HDV coinfection rate was 8.5% in blood donors (11/130), 65.0% (39/60) in outpatient subjects and 47.0% (16/34) in individuals from Eirunepe. Compared to blood donors, coinfection was higher in outpatient subjects (65.0% versus 8.5%; RR = 5.0; CI 3.4-7.9; p < 0.0001) and in subjects from Eirunepe (47.0% versus 8.5%; RR = 5.5; CI 3.0-9.9; p < 0.0001). HBV-HDV coinfection rates were higher in patients from highly endemic remote cities. Only HDV genotype 3 was detected, HBV/F-HDV/3 predominated (20/38; 52.7%), followed by HBV/D-HDV/3 (31.6%; 12/38) and HBV/A-HDV/3 (15.8%; 6/38). CONCLUSIONS: The description of HBV and HDV genotypes circulating in the western Amazon can contribute to a better understanding of their relevance on the regional epidemics. These infections are highly endemic in the Amazon where their control is challenged by its vast territorial dimension with small, hard-to-reach municipalities dispersed into the jungle and populated by diverse ethnic groups.


INTRODUCTION: Few Latin American studies have assessed the prevalence of hepatitis C virus (HCV) infection in elderly individuals, in whom the highest rates are expected. We aimed to investigate the prevalence of and factors associated with HCV infection in elderly residents in the municipality of Tubarao, Santa Catarina. METHODS: This cross-sectional study included 820 individuals (aged >/= 60 years) who were selected by simple random sampling. The presence of anti-HCV antibodies was tested by chemiluminescence, and HCV RNA detection was performed for the anti-HCV-reactive subjects. Those individuals who were anti-HCV reactive but had undetectable HCV RNA levels were tested using a third-generation recombinant immunoblot assay. The variables were compared using the chi-squared test or Fisher’s exact test, and those variables with p < 0.05 were included in the logistic regression model. RESULTS: The mean patient age was 68.6 years (SD 7.0 years); 39% were men, and 92% were Caucasian. Eighteen subjects were anti-HCV positive. Among these individuals, 4 were characterized as false-positives, leaving 14 (1.7%) individuals with confirmed infections for analysis. HCV infection was associated with an age older than 65 years, households with 3 or more residents and the previous transfusion of blood products. In the logistic regression analysis, the following variables were independently associated with HCV infection: households with 3 or more residents (OR 7.9, 95% CI 1.7-35.9, p = 0.008) and previous blood
transfusion (OR 6.2, 95% CI 2.1-18.6, p = 0.001). CONCLUSIONS: The HCV prevalence in the elderly population in the municipality of Tubarao was higher than that found in previous studies of blood donors in the same region. Although exposure to contaminated blood products remained important, other transmission routes, such as household transmission, could play a role in HCV infection.


OBJECTIVE: To describe general data on nucleic acid/serology testing and report the first hepatitis B-nucleic acid testing yield case of an immunized donor in Brazil. METHODS: A total of 24,441 donations collected in 2010 and 2011 were submitted to individual nucleic acid testing for hepatitis B, hepatitis C and human immunodeficiency virus using the TaqMan((r)) MPX kit (Roche) on the Cobas s201 platform, in addition to routine screening for serological markers. Nucleic acid testing-reactive donations were further evaluated by real-time polymerase chain reaction using Cobas AmpliPrep/Cobas TaqMan hepatitis B virus, hepatitis C virus and human immunodeficiency virus tests. RESULTS: Thirty-two donations were reactive by nucleic acid testing, 31 were also serologically reactive and one first-time donor was identified as having hepatitis B in the window period. Follow-up samples showed increasing titers of anti-HBs rising from 19 UI/mL in the index donation to 109 IU/mL seven months later attributable to his vaccination history. Curiously, this donor was never reactive for HbsAg nor for anti-HBc. In the yield donation, he was concomitantly reactive for syphilis (enzyme immunoassay and fluorescent treponemal antibody-absorption; venereal disease research laboratory non-reactive). Overall, six donors (0.02%) were characterized as occult hepatitis B. A total of 35% of the confirmed (recombinant immunoblot assay positive) hepatitis C donations were nucleic acid testing non-reactive and no human immunodeficiency virus "elite controller" was identified. CONCLUSION: The yield rate (1:24,441; 95% confidence interval: 1:9,537 - 1:89,717) contrasts to the North American rate (1:410,540 donations) and strongly advocates the adoption of nucleic acid testing for hepatitis B in Brazil despite the increasing rate of anti-HBs reactive subjects due to the successful immunization program.


OBJECTIVE: To estimate the prevalence of hepatitis C using a rapid hepatitis C virus (HCV) test in an inmate population from the countryside of Rio Grande do Sul, Brazil. METHODS: Through a descriptive study, 195 inmates were evaluated by random sampling. RESULTS: A total of 9.7% of the inmates were positive. In this analysis, the variable injectable drug use was predictive of HCV infection. CONCLUSION: The high prevalence of positive serology for HCV observed among the inmates is of particular concern, as it is much higher than in the general population. Therefore, it is necessary to conduct specific approach campaigns to gather more information on infectious diseases in prison settings, as well as to provide appropriate treatment to prevent viral dissemination.


OBJECTIVE: The objective of this study was to verify the prevalence and vertical transmission rate of HIV, syphilis and hepatitis B in pregnant women in the municipality of Itajai, state of Santa Catarina, Brazil, during the 2002-2007 period. METHODS: Data were collected in a retrospective population-based longitudinal study using computerized medical records of the state and local health authorities during the 2002-2007 period for HIV, and 2004-2007 for syphilis and hepatitis B. RESULTS: The prevalence of HIV, acute hepatitis B, chronic hepatitis B and syphilis in pregnant women was 1.7%, 0.41%, 0.46%, and 0.43%, respectively. Overall, vertical transmission of HIV was 6.28%, although it was less than 5% among women diagnosed with HIV before or during pregnancy, compared to 20% and 55% among women first diagnosed with HIV during and after delivery, respectively. Vertical transmission of syphilis was 68.89%. No trend was confirmed for the transmission rate either regarding the year of diagnosis or age group of pregnant women. Almost 44% of HIV infected pregnant women knew their HIV status before becoming pregnant; the HIV transmission rate for these women was less than 5%. No case of vertical transmission was observed for hepatitis B. CONCLUSIONS: The vertical transmission rate for HIV was within the target of the Ministry of Health when HIV diagnosis was made during pregnancy, but increased sharply when the diagnosis was made only at delivery. Vertical transmission of syphilis was much higher than expected, showing the importance of reinforcing the procedures recommended for its reduction.


OBJECTIVES: We aimed to investigate the prevalence of Hepatitis C in adult users of the Public Health Services of Sao Jose dos Pinhais - Parana. METHODS: We performed an epidemiological survey with a probabilistic sample of 5,017 volunteers who answered a questionnaire and were submitted to an anti-HCV quick test. Data were organized using Epi-info 3.5.1. The association between the presence of the disease and the factors of interest in the study were evaluated by the Chi-square test. We used a Logistic Regression Adjusted Model for risk factor analysis and the Wald test for decision making on the importance of the risk factors. RESULTS: The absolute

METHODS: Serum samples underwent enzyme-linked immunosorbent assay to investigate total antibodies against HbcAg (anti-Hbc), HBsAg, and antibodies against HbsAg (anti-HBs). Samples that were HBsAg-negative were tested for total anti-HBc, and those that were positive for total anti-Hbc were tested for anti-HBs. HBV DNA was investigated with an in-house PCR technique to identify samples positive for total anti-Hbc. Subsequently, the samples positive for HBV DNA were sequenced to identify the genotype and mutations. RESULTS: The study population (n = 752) had a mean age of 50 ± 15 years and included both sexes. All samples analyzed were negative for HBsAg. The seroprevalence of total anti-HBc was 26.7% (201/752), while that of anti-Hbs was 67.2% (153/221). Total anti-Hbc alone was detected in 5.7% of the patients. Occult infection was found in 1.5%, comprising genotypes A (33.3%, 1/3) and D (66.7%, 2/3). No mutations were found. CONCLUSIONS: The study detected occult hepatitis B virus infection among hemodialysis patients. Molecular studies on HBV are of fundamental importance because they identify patients that had been considered virus-negative but who, in reality, host the virus and have the ability to transmit it to other patients and staff.

INTRODUCTION: Persistence of the hepatitis B virus (HBV) genome in individuals negative for the HBV surface antigen (HBsAg) reflects occult infection. The aim of this study was to identify occult HBV infection among hemodialysis patients at 5 clinics in Recife, State of Pernambuco, Brazil, between August 2006 and August 2007. METHODS: A total of 180 samples were analyzed and subjected to polymerase chain reaction (PCR) and semi-nested PCR of the HBV S-gene, with the aim of determining the prevalence of HBV-DNA (deoxyribonucleic acid) in indigenous groups inhabiting the areas near the Curuca and Itaquai Rivers in the Javari Valley, State of Amazonas, Brazil. RESULTS: The prevalence of the HBV-DNA S-gene was 51.1% (92/180). The analysis found 18 of 49 (36.7%) samples from individuals exposed to swine in rural MT was similar to that found in previous studies in Brazil. This prevalence did not characterise this population (n = 752) had a mean age of 50 ± 15 years and included both sexes. All samples analyzed were negative for HBsAg. The seroprevalence of total anti-HBc was 26.7% (201/752), while that of anti-Hbs was 67.2% (153/221). Total anti-Hbc alone was detected in 5.7% of the patients. Occult infection was found in 1.5%, comprising genotypes A (33.3%, 1/3) and D (66.7%, 2/3). No mutations were found. CONCLUSIONS: The study detected occult hepatitis B virus infection in hemodialysis patients. Molecular studies on HBV are of fundamental importance because they identify patients that had been considered virus-negative but who, in reality, host the virus and have the ability to transmit it to other patients and staff.
frequent genotypes are A, D, and F. METHODS: This study aimed to characterize the HBV genotypes in cases of hepatitis B virus and hepatitis D virus (HDV) co-infections in an endemic area in the Western Brazilian Amazon. We analyzed 86 serum samples reactive for HBsAg from indigenous and non-indigenous populations obtained from previous serological surveys. RESULTS: Of the 86 reactive serum samples, 39 were found to be HBV-DNA-positive by semi-nested PCR. The genotypes were established by sequencing the amplified S gene region. We obtained 20 sequences classified into three genotypes: A, D, and F. Genotype A was the most frequent (60%), followed by D (35%) and F (5%). CONCLUSIONS: The distribution of the HBV genotypes reflected the pattern of historical occupation of the region.


INTRODUCTION: A decline in hepatitis D virus (HDV) occurrence was described in Europe and Asia. We estimated HDV prevalence in the Brazilian Amazon following hepatitis B vaccination. METHODS: This is a cross-sectional survey of HDV measured by total antibodies to HDV (anti-HD T). RESULTS: HDV prevalence was 41.9% whiting HBsAg carries and was associated with age (PR = 1.96; 95% CI 1.12-3.42; p = 0.01), hepatitis B virus (HBV) infection (PR = 4.38; 95% CI 3.12-6.13; p < 0.001), and clinical hepatitis (PR =1.44; 95% CI 1.03-2.00; p = 0.03). Risk factors were related to HDV biology, clinical or demographic aspects such as underlying HBV infection, clinical hepatitis and age. CONCLUSIONS: Our study demonstrated that HDV infection continues to be an important health issue in the Brazilian Amazon and that the implementation of the HBV vaccination in rural Labrea had little or no impact on the spread of HDV. This shows that HDV has not yet disappeared from HBV hyperendemic areas and reinforcing that it is far from being a vanishing disease in the Amazon basin.


In this study, the prevalence, genotypic frequency, and risk factors for HCV infection in 768 patients infected with HIV were determined. Fifty-two (6.77 %) HIV-positive individuals had anti-HCV antibodies and 26 (3.39 %) had HCV-RNA. Genotyping results indicated that all RT-PCR samples from patients infected with HCV belonged to genotype 1. Multivariate analysis revealed an association of HIV-HCV coinfection with drug use and having received blood transfusions before 1994. The relatively low prevalence of HCV infection in the HIV-positive population in that region may be a consequence of the small number of drug users in the sample, despite a strong association between HCV infection and drug use.


Age-related seroepidemiology studies that have been conducted in Brazil have indicated a transition from a high to a medium endemicity of hepatitis A virus (HAV) infection in the population. However, most of these studies have focused on urban populations that experience lower incidence rates of HAV infection. In the current study, the prevalence of anti-HAV antibodies was investigated in children with a low socioeconomic status (SES) that live on the periphery of three capital cities in Brazil. A total of 1,162 dried blood spot samples were collected from individuals whose ages ranged from one-18 years and tested for anti-HAV antibodies. A large number of children under five years old (74.1-90%) were identified to be susceptible to HAV infection. The relatively low prevalence of HAV infection in the HIV-positive population in that region may be a consequence of the small number of drug users in the sample, despite a strong association between HCV infection and drug use.


INTRODUCTION: Viral hepatitis is a major public health concern in Brazil. There are few past studies on this issue, especially among riparian communities. This study aims at determining the seroprevalence of viral hepatitis B and C in the riparian community of Pacui Island, within the Cameta municipality of Para State, Brazil. Moreover, this study aims to investigate the principal risk factors that this community is exposed to. METHODS: The current study has accessed blood samples from 181 volunteers who have answered an epidemiological questionnaire. Analyses on serological markers have been tested with commercial ELISA kits for detecting HBsAg, total anti-HBc, anti-HBs, and anti-HCV. Within seroreactive patients for HCV, RT-PCR and line probe assay have been performed to identify the viral genotype. RESULTS: In the serological marker analysis for hepatitis B, no reactivity for HBsAg, rate of 1.1% for total anti-HBc, and rate of 19.3% for anti-HBs have been observed. On hepatitis C, 8.8% seroprevalence has been found, in which 62.5% have gotten viral RNA. Among the risk factors studied, the
following have been highlighted: non-use of condoms, sharing of cutting instruments, use of illicit drugs, and reports of family disease with HBV or HCV. CONCLUSIONS: The vaccination coverage against HBV is low, and the high prevalence of HCV within this community has been observed.


The study was aimed at estimating the prevalence of infection with and the genotype of hepatitis C virus (HCV), and to determine the extent of underreporting of HCV cases. A total of 115,386 pregnant women seen by the Program for Protection of Pregnancy [Programa Estadual de Protecao a Gestante] of the state of Mato Grosso do Sul, Central-Western Brazil, were tested for anti-HCV antibodies between 2005 and 2007. Prevalence of HCV infection was 1.07 cases per thousand. Positive serological tests were tested for HCV RNA and genotyped. Genotype 1 was detected in 73% of samples, genotype 3 in 24.3%, and genotype 2 in 2.7%. Underreporting of hepatitis C cases was 35.5%.


INTRODUCTION: Positive serological tests for hepatitis viruses B and C at blood banks are an important reason for blood deferral. Additionally, high residual risk for transfusing hepatitidis-contaminated blood has been estimated in southern Brazil. This study aimed to identify risk factors for positive serological tests for viral hepatitis (VH) in blood donors (BD). METHODS: A case-control study included consecutive BD with positive serology for VH, between 2008 and 2009. Cases and controls (BD with negative serology for VH) were paired 1:1 by sex and donation date. Assessment of clinical and epidemiological characteristics related to viral hepatitis was conducted. RESULTS: Among 1,282 blood donors (641 cases and 641 controls), those with positive serology for viral hepatitis had higher mean age (p<0.001); higher proportion of replacement donation (p<0.001); first donation (p<0.001); and interviewer deferment (p=0.037), compared to controls. Furthermore, donors with positive tests were less regular donors (p<0.001), had less previous history of rejection (p=0.003) and showed lower hematocrit median before donation (p=0.019). Multivariate analysis demonstrated that age (OR=1.056, 95%CI 1.042-1.069, p<0.001), replacement donation (OR=1.545, 95%CI 1.171-2.038, p=0.002) and first donation (OR=9.931, 95%CI 7.486-13.173, p<0.001) were independently associated with positivity of serological tests for viral hepatitis. CONCLUSIONS: Specific characteristics of blood donors were associated with positive serology for viral hepatitis. These peculiarities should be taken into account when assessing candidates for blood donation.


INTRODUCTION: Hepatitis B is common in Brazil, although there are regional differences regarding the degree of endemicity, the most frequent forms of transmission and the presence of different evolutive stages of chronic disease. The present study aimed to determine the clinical, demographic and epidemiological characteristics of patients chronically infected with hepatitis B virus (HBV) residing in the Ribeirao Preto region, southeastern Brazil. METHODS: A total of 529 medical records of individuals with HBV mono-infection were reviewed. RESULTS: More than 60% of the subjects were males, with a mean age of 38 years-old. The HBeAg-negative serological pattern was verified in 84.4% of the patients, among whom the risk of vertical/intrafamily transmission was 43.2% (p = 0.02). The consumption of alcohol in amounts exceeding 20 g a day was observed in 21.3% of the subjects and was more frequent among men (33%) (p < 0.001). Among patients with cirrhosis, 54.1% were alcohol abusers (p = 0.04), all of them males. The presence of cirrhosis was more frequent in the HBeAg-positive group (24.4%) than in the HBeAg-negative group (10.2%) (p < 0.001). CONCLUSIONS: High proportions of HBV-infected subjects with an HBeAg-negative pattern were observed, with a higher risk of vertical/intrafamily transmission. Alcohol abuse was associated with male subjects and with cirrhosis of the liver in this group. A tendency toward an increase in the number of HBeAg-negative cases was observed over time.


INTRODUCTION: Data concerning hepatitis C virus infection during pregnancy in Brazilian medical services are scarce. This study aimed to verify factors associated with vertical transmission (VT) of HCV in pregnant women. METHODS: Observational transversal study of pregnant women from Campo Grande, MS, central Brazil, with confirmed reagent serology for HCV infection from 2002 to 2005. Vertical transmission was considered to be positive HCV serology by ELISA, confirmed by PCR, after 18 months of life of the newborn. The factors studied associated with VT were: delivery mode, time of premature rupture of membranes, breastfeeding, blood transfusion history, drug addiction, number of sexual partners and the presence of body tattoos. RESULTS: Fifty-eight pregnant women with HCV infection were identified, indicating a prevalence rate of 0.2% (58/31,187). Of these 58 pregnant women, 23 (39.6%) fulfilled the inclusion criteria. The VT rate was 13% (3/23), and the most
frequent HCV viral subtypes were 1a (53%), 1b (30%), 2b (4%) e 3a (13.0%). Two (8.7%) patients were coinfected with HIV. A significant association (p < 0.05) was observed between VT and high maternal serum viremia (> 2.5 x 10^6) and VT and the use of illicit drugs by the mother. CONCLUSIONS: The present study demonstrates that high serum maternal viremia for HCV and the use of illicit drugs by the mother are associated with vertical transmission of HCV.


Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections account for a substantial proportion of liver diseases worldwide. The aim of this study was to determine the prevalence of HBV and HCV serological markers among children and adolescents and verify the epidemiology of the HBV infection over than a decade of the introduction of vaccination program. Serologic markers to HBsAg, total anti-HBc and anti-HCV had been tested in 393 samples. The seropositivity for HBsAg was 0.76% and for total anti-HBc was 1.02%. Copositivity between HBsAg and total anti-HBc was verified in 0.76% of the analyzed samples. There was no seropositivity for anti-HCV marker. The seroprevalence of HBV infection markers among children and adolescents in the southern Brazilian region is high compared to that reported in other countries. Preventive measures, such as educational activities in addition to the universal childhood HBV vaccination, should be initiated in order to reduce the morbimortality and the economic burden associated with the disease.


Hepatitis C is a major cause of chronic liver disease worldwide. There is a significant variation in the prevalence of hepatitis C virus (HCV) infection according to the geographic region studied. These discrepancies reflect not only distinct epidemiological characteristics among the populations, but also differences in the methodologies used for the estimates. Despite scarce data, estimates indicate that Brazil is a country with an intermediate prevalence of HCV infection, ranging from 1% to 2%. The most important risk factors for HCV acquisition include injection drug use, blood product transfusion, organ transplantation, hemodialysis, occupational injury, sexual transmission and vertical transmission. Because there is no vaccine and no post-exposure prophylaxis for HCV, the focus of primary prevention efforts should be identification and removal of the risk factors. In this article we review literature regarding the prevalence of HCV infection, particularly in Brazil. In addition, we discuss the pattern of HCV infection according to the age groups and risk factors for HCV acquisition.


INTRODUCTION: Epidemiological studies concerning HCV genotypic distribution in the Brazilian Amazon are scarce. Thus, this study determined the patterns of distribution of HCV genotypes among different exposure categories in the State of Para, Brazilian Amazon. METHODS: A cross-sectional study was conducted on 312 HCV-infected individuals belonging to different categories of exposure, who were attended at the HEMOPA, CENPREN and a private hemodialysis clinic in Belem. They were tested for HCV antibodies using an immunoenzymatic test, RNA-HCV, using real-time PCR and HCV genotyping through phylogenetic analysis of the 5' UTR. The population groups were epidemiologically characterized according to data collected in a brief interview or medical consultation. RESULTS: Genotype 1 predominated in all the different categories of HCV exposure. HCV genotypic distribution among blood donors comprised genotypes 1 (94%) and 3 (6%). All patients with chronic hematologic diseases had HCV genotype 1. The genotypic distribution in illicit-drug users comprised genotypes 1 (59.6%) and 3 (40.4%). In patients under hemodialysis, genotypes 1 (90.1%), 2 (3.3%), and 3 (6.6%) were detected. Finally, the frequency of genotypes 1 and 3 was significantly different between the groups: BD and DU, PUH and DU, PUH and PCHD and PCHD and DU. CONCLUSIONS: The genotypic frequency and distribution of HCV in different categories of exposure in the State of Para showed a predominance of genotype 1, regardless of the possible risk of infection.


OBJECTIVES: To estimate the prevalence of antibodies to hepatitis A virus (antiHAV-IgG) in children aged 7-14 years from public and private schools, and to identify demographic, socioeconomic and sanitation factors associated with the prevalence of antiHAV-IgG. METHODS: Seroepidemiological study for the detection of IgG antiHAV. It was conducted from April 2002 to April 2004 with 462 elementary school students from Sao Luis, ranging from 7 to 14-years of age. Thirty schools randomly selected took part in the study, with a probability proportional to the number of students enrolled; 23 schools were public and 7 were private. Data was obtained through a structured questionnaire. In order to identify the variables independently associated with IgG antiHAV, the Poisson multiple regression analysis was performed, estimating the adjusted PRs and their 95% confidence intervals. The variables associated with the prevalence of hepatitis A with p < 0 were the only ones that remained in the final model. The level of significance of 0.05 (alpha = 0.05) was adopted. RESULTS: The prevalence of
antiVHA-IgG was 64%, 71.5% in public and 36.5% in private schools. After multivariate analysis, age 11 to 14 years, more than one person per bedroom, and less than two bathrooms per household were associated with a higher prevalence of antiVHA-IgG. Higher parental education was associated with lower prevalence of antiVHA-IgG. CONCLUSIONS: Hepatitis A is endemic among schoolchildren in Sao Luís. The prevalence rate was similar to those found in other regions of the country with similar socio-economic and health conditions. Factors historically associated with a higher prevalence of hepatitis A were also identified in this population.


Leprosy and hepatitis B virus (HBV) are highly endemic in some regions of the state of Mato Grosso, in central Brazil. The association of leprosy with HBV and hepatitis C virus (HCV) was assessed using a seroprevalence study and 191 leprosy outpatients were included. Demographic data and the clinical classification of leprosy were recorded. Evidence of previous HBV infection was present in 53 patients (27.7%, 95% confidence interval: 21.9-34.5) and two (1%) were HBsAg positive. Five (2.6%) had antibodies to HCV. The prevalence of previous exposure to HBV was higher than expected for an adult population in central Brazil. In contrast, the prevalence of anti-HCV antibodies was not much higher regarding the age range of participants. HBV markers were associated with a higher number of sex partners and the use of injections without proper sterilisation of the syringes. The number of HBV carriers was small, suggesting that there was no increased likelihood of chronification among these patients.


INTRODUCTION: Little is known about the epidemiology of hepatitis B virus (HBV) infection in populations from inner cities, especially in Central Brazil. Thus the objective of this study was to estimate the prevalence of HBV infection, and to analyze the factors associated with HBV infection, in a population of first-time blood donors in the southwestern region of Goias, Central Brazil. METHODS: A total of 984 individuals were interviewed and gave blood samples to detect serological markers of HBV (HBsAg, anti-HBs, and anti-HBc) by enzyme linked immunosorbent assays. RESULTS: An overall prevalence of 6.9% was found for HBV, with constituent prevalence rates of 3.6% and 11.6%, in subjects classified as fit and unfit to donate blood according the epidemiological screening, respectively. Only three individuals were positive for anti-HBs alone, suggesting previous vaccination against HBV. The variables of prior blood transfusion (OR = 2.3), tattoo/piercing (OR = 2.1), illicit drug use (OR = 2.3), sex with a partner with hepatitis (OR = 14.7), and history of sexually transmitted diseases (OR = 2.9) were independently associated with HBV-positivity. These data suggested a low endemicity of hepatitis B in the studied population. CONCLUSION: The findings of low hepatitis B immunization coverage and the association of hepatitis B with risky behavior highlight that there is a need to intensify hepatitis B prevention programs in the southwest region of Goias.


A population-based survey to provide information on the prevalence of hepatitis viral infection and the pattern of risk factors was carried out in the urban population of all Brazilian state capitals and the Federal District, between 2005 and 2009. This paper describes the design and methodology of the study which involved a population aged 5 to 19 for hepatitis A and 10 to 69 for hepatitis B and C. Interviews and blood samples were obtained through household visits. The sample was selected using stratified multi-stage cluster sampling and was drawn with equal probability from each domain of study (region and age-group). Nationwide, 19,280 households and ~31,000 residents were selected. The study is large enough to detect prevalence of viral infection around 0.1% and risk factor assessments within each region. The methodology seems to be a viable way of differentiating between distinct epidemiological patterns of hepatitis A, B and C. These data will be of value for the evaluation of vaccination policies and for the design of control program strategies.


INTRODUCTION: This paper describes the investigation to confirm an outbreak of hepatitis A, presents the case distribution by person, time and place, formulates a hypothesis concerning the mode of transmission and presents the recommended measures for prevention and control. METHODS: A descriptive study of a case series and an environmental research were conducted. RESULTS: An outbreak of hepatitis A was confirmed beginning in March 2009. Forty one (71%) individuals in the town received untreated water in their households. Thermotolerant coliform bacteria were detected in 20/58 (34%) water samples. CONCLUSIONS: Consumption of contaminated water was the main hypothesis of virus transmission.
Given the scarcity of epidemiological information on hepatitis C virus (HCV) infection in Northern Brazil, we determined the prevalence and genotypic frequency in blood donors in the state of Para (PA). Blood samples from all of the blood donors at the Fundacao HEMOPA (blood bank of PA) from 2004-2006 were screened for the presence of antibodies to anti-HCV and samples seroreactive to anti-HCV were further tested for HCV RNA using real-time PCR. In total, 116 HCV-RNA samples were genotyped, based on maximum likelihood phylogenetic analyses, using BioEdit, Modelgenerator, PHYML and FigTree software. The population consisted of 242,726 volunteers who donated blood from 2004-2006; the most common subgroup was males between the ages of 18-29 years old (37.30%). Within the whole group, 1,112 blood donors (0.46%) had indeterminate or positive serology; among these, 28.78% were males whose ages ranged from 18-29 years. A diagnosis of chronic HCV infection was confirmed for 304 donors (60.20% males; 66.45% were 30-49 years old), resulting in a prevalence of HCV RNA in 0.13% of the samples (304 of 242,726). HCV genotyping revealed a high frequency of genotype 1 (108/116) followed by genotype 3 (8/116). This study found HCV infection to be relatively infrequent in PA; genotype 1 was most commonly isolated. This information can help guide prevention and control policies aimed at efficient diagnosis and control measures.


PURPOSE: to estimate the prevalence infection of human immunodeficiency virus (HIV), human T-cell lymphotropic virus (HTLV), hepatitis B virus (HBV), Chlamydia trachomatis (C. trachomatis) and syphilis in pregnant women, as well as risk factors associated with these infections, in Fundacao de Medicina Tropical do Amazonas (FMTAM). METHODS: a cross-sectional study was carried including 674 pregnant women consecutively attended of the spontaneous demand of FMTAM between March and September 2008. Demographic, epidemiologic, socioeconomic, clinical and obstetric information have been collected through specific questionnaires. Patients had blood sample collected by peripheral venous for accomplishment of serological tests of HIV, HTLV, HBV and syphilis. Cervical secretion sample has been collected for C. trachomatis antigens detection test. The Odds Ratio has been used to evaluate risk factors associated to infections. Statistical analysis has been done with the t-Student, chi2 and Fisher’s exact tests. RESULTS: the average age was 23.9 years old (SD 6.3). The observed prevalence was 0.6% to infection by HIV; 0.7% by HBsAg; 1.0% of syphilis and 2.7% by C. trachomatis. All the samples went negatives to HTLV. There were no variables associated with infection by HIV, HBV and syphilis. Significant statistically association was observed between pregnant woman with age under 20 years and of first pregnancy with C. trachomatis infection. CONCLUSIONS: the study evidenced that the prevalence infection by HIV in pregnant women assisted in FMTAM is similar to the values described in the Brazilian literature, while the prevalence by HTLV, HBV, syphilis and C. trachomatis in the studied population are below found by other authors. The main risk factor for the infection by C. trachomatis was being under 20 years old.


Epidemiological parameters, such as age-dependent force of infection and average age at infection (<IMG SRC="../img/13s1.gif" WIDTH="9" HEIGHT="12;">) were estimated for rubella, varicella, rotavirus A, respiratory syncytial virus, hepatitis A and parvovirus B19 infections for a non-immunized Brazilian community, using the same sera samples. The for the aforementioned diseases were 8.45 years (yr) [95% CI: (7.23, 9.48) yr], 3.90 yr [95% CI: (3.51, 4.28) yr], 1.03 yr [95% CI: (0.96, 1.09) yr], 1.58 yr [95% CI: (1.39, 1.79) yr], 7.17 yr [95% CI: (6.48, 7.80) yr] and 7.43 yr [95% CI: (5.68, 9.59) yr], respectively. The differences between average ages could be explained by factors such as differences in the effectiveness of the protection conferred to newborns by maternally derived antibodies, competition between virus species and age-dependent host susceptibility. Our seroprevalence data may illustrate a case of the above-mentioned mechanisms working together within the same population.


This study evaluated the prevalence of hepatitis A virus infection in the rural area of Labrea, in the western Brazilian Amazon region. Communities and households were selected randomly. Serum samples were analyzed by means of the immunoenzymatic method for the presence of total antibodies against HAV. The study included 1,499 individuals. The prevalence of anti-HAV was 74.6% (95% CI 72.3-76.8). Univariate analysis showed associations with age (chi-square for linear trend = 496.003, p < 0.001), presence of outside toilet (p < 0.001), history of hepatitis (p < 0.001) and family history of hepatitis (p = 0.05). After adjusting for age, HAV infection also showed an association with the number of people in the family (p = 0.03). The overall prevalence rates were high, but not more than 60% of the children under the age of ten years had already been infected. Very high
prevalence was detected only within older cohorts, thus paradoxically defining this as a region with intermediate endemicity, even under the conditions of poverty encountered.


OBJECTIVE: There is evidence that patients with mental illness have increased prevalence of sexually transmitted infections, but data in Brazil are scarce. The objective of this study was to determine the prevalence of HIV, hepatitis C and B, and syphilis among patients with mental illness in Brazil. METHOD: A multicenter representative sample of adults with mental illness was randomly selected from 26 mental health institutions throughout Brazil. Sociodemographic, sexual behavior and clinical data were obtained from person-to-person interviews and blood was collected for serology testing. Seroprevalence with 95% confidence limits were obtained correcting for sampling scheme. RESULTS: Of the 2,475 patients interviewed, 2,238 had blood collected. Most participants were sexually active ever (88.8%) or in the last 6 months (61.6%), female (51.9%), and single (66.6%). Half of the sample had less than 5 years of schooling and the mean monthly individual income was low (US$ 210.00). Condom use was very low either during lifetime (8%) or in the last 6 months (16%). Overall seroprevalence were 1.12%, 0.80%, 1.64%, 14.7% and 2.63% for, respectively, syphilis, HIV, HBsAg, anti-Hbc and anti-HCV. CONCLUSIONS: Seroprevalences found were higher than other populations with representative studies in Brazil, with high rates of sexual risk behavior. This is of public health concern, and prevention and care strategies for sexually transmitted infections among psychiatric patients should urgently be implemented by health authorities.


Sexually transmitted infections during pregnancy pose a major risk to the fetus due to vertical transmission. The study’s objective was to determine the prevalence of HIV, syphilis, hepatitis B and C, and HTLV-I/II infection among low-income postpartum and pregnant women treated in Greater Metropolitan Vitoria, Espirito Santo State, Brazil, and the risk factors associated with these infections. A cross-sectional study was conducted from February to October 1999 assessing postpartum and pregnant women from the maternity ward of the Vitoria Mercy Hospital and the Carapina Outpatient Referral Unit in the Municipality of Serra, respectively. Patients were systematically interviewed and had blood samples drawn for serological tests (HIV 1&2, VDRL, HbsAg, anti-HCV, and HTLV-I/II). A total of 534 patients (332 postpartum and 202 pregnant women) were assessed. Seroprevalence rates for the target infections in postpartum and pregnant women and the overall sample were as follows, respectively: HIV 0.9%, 0%, and 0.6%; syphilis 2.1%, 3.6%, and 2.7%; HBV 1.2%, 1%, and 1.1%; HCV 1.8%, 0.6%, and 1.4%; and HTLV-I/II 1.7%, 0.6%, and 1.3%. Factors associated with the various infections are presented and analyzed in light of other research findings from the literature.


Hepatitis C virus (HCV) infection has quite high prevalence in the prison system, reaching rates of up to 40%. This survey aimed to estimate the prevalence of HCV infection and evaluate risk factors for this exposure among male inmates at the Ribeirao Preto Prison, State of Sao Paulo, Brazil, between May and August 2003. A total of 333 participants were interviewed using a standardized questionnaire and underwent immunoenzymatic assaying to investigate anti-HCV. The prevalence of HCV infection among the inmates was 8.7% (95% CI: 5.7-11.7). The participants’ mean age was 30.1 years, and the prevalence was predominantly among individuals over 30 years of age. Multivariate analysis showed that the variables that were independently associated with HCV infection were age > 30 years, tattooing, history of previous hepatitis, previous injection drug use and previous needle-sharing.


The aim of the present study was to outline the serological profile of hepatitis C among blood donors seen at the Uberaba Regional Blood Center, Hemominhas Foundation, over the last 14 years. The frequency of hepatitis C was compared between first-time and repeat donors and the epidemiological characteristics of those with positive and indeterminate ELISA anti-HCV (third and fourth generation) were analyzed based on the donor histories kept in the archives of the Uberaba Regional Blood Center. The serological ineligibility rate was 0.3%, with higher prevalence in the group of first-time donors. We did not find any significant differences regarding age, skin color, marital status or place of residence between eligible and ineligible donors; however, the frequency of positive serology was higher among men. The lower (0.3%) rate of ineligibility due to hepatitis C that was observed at the Uberaba Regional Blood Center, in relation to most Brazilian blood centers, is probably due to the large number of repeat donors (83.3%). This reinforces the importance of achieving donor commitment for increasing transfusion safety.

This article aimed to estimate the prevalence of hepatitis C in Botafogo, a district of Bebedouro, Sao Paulo State, Brazil, and investigate possible risk factors. One individual over 18 years of age was selected from each household to answer a questionnaire on socio-demographic variables and factors associated with hepatitis C. Blood samples were also drawn for immunoenzymatic tests. Positive HCV-antibody samples were submitted to viral RNA detection. HCV prevalence was 8.8% (95% CI: 5.8-11.7), and independent variables associated with risk of infection were: male gender, time of local residence > 30 years, and history of injected medication using non-disposable material, sterilized by boiling. The high prevalence of hepatitis C infection in this relatively isolated rural population appears to result from previous exposure to injections with inadequately sterilized material, with some evidence suggesting a specific elderly pharmacy employee who customarily applied such injections and may have been a chronic HCV carrier.


An investigation was conducted involving 255 renal transplant recipients in the state of Goias, Central Brazil, to determine the prevalence of hepatitis C virus (HCV), its risk factors, the genotypes involved, and the level of alanine aminotransferase (ALT) present in the patients. All serum samples were tested for anti-HCV antibodies and HCV RNA. Forty-one patients were anti-HCV and/or HCV RNA positive, resulting in an overall HCV infection prevalence of 16.1% (95% CI: 11.9-21.3). A multivariate analysis of risk factors showed that a history of blood transfusions without anti-HCV screening, the length of time spent on hemodialysis, and renal transplantation before 1994 are all associated with HCV positivity. In HCV-positive patients, only 12.2% had ALT levels above normal. Twenty-eight samples were genotyped as genotype 1, subtypes 1a (62.5%) and 1b (31.3%), and two samples (6.2%) were genotype 3, subtype 3a. These data show a high prevalence of HCV infection and low ALT levels in the studied population. The risk factor analysis findings emphasize the importance of public health strategies such as anti-HCV screening of candidate blood and organ donors, in addition to the stricter adoption of hemodialysis-specific infection control measures. The present study also demonstrates that HCV genotype 1 (subtype 1a) is predominant in this population.

### 3.4 viral hepatitis in Risk groups in Brazil

Pubmed MEDLINE search on on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnostics) AND (Brazil OR Braslil) NOT autoimmune} in all fields, was performed. In End NOTE a second search was done on {Brazil ANDRisk Groups OR co-infection} After a manual search only the references and the abstracts really related to the subject were selected and classified. The references ar ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.

**RISK GROUPS**


BACKGROUND: Currently, sharing of drug paraphernalia is the main form of HCV transmission worldwide. In South America, consistent findings indicate that shared sniffing equipment is an important factor in the spread of HCV among non-injecting drug users. Epidemiological data on the status of HCV infection in illicit drug users in the Amazon region are scarce, although reports of clinical cases of hepatitis or pathologies associated with HCV infection in other population groups are numerous. Thereby, this study investigated the prevalence, genotype frequency, and epidemiological factors associated with HCV infection in non-injecting drug users in the state of Para, eastern Amazon. RESULTS: During 2008-2011, 300 non-injecting drug users attending drug-treatment centers participated in this study. Most non-injecting drug users were male (63.7%). The mean age was 32.5 years. The non-injecting drugs most consumed were: cannabis (15.6%), cocaine paste (21.3%), and oxi cocaine (25.7%). Tobacco (60.9%) and alcohol (79.4%) were also commonly consumed. One hundred six (35.1%; CI 95%: 29.8 - 41.1) non-injecting drug users presented anti-HCV antibodies by EIA. The HCV-RNA prevalence was 28.0% (95% CI: 20.6 - 35.8). Genotypes 1 (76.9%) and 3 (23.1%) of HCV have been identified. A multivariate analysis demonstrated that HCV infection was independently associated with the following factors: "age (> = 35 years)"
PURPOSE: To ascertain the seroprevalence of human immunodeficiency virus (HIV), hepatitis B (HBV), and hepatitis C virus (HCV) infections among female prisoners of Metropolitan Regional Prison Complex in the state of Goias, Central Brazil. METHODS: Women incarcerated in the largest prison in the State of Goias were invited to participate in the study. All female prisoners were HCV RNA positive and classified as genotypes 1 (subtypes 1a; n = 3 and 1b; n = 1) and 3 (subtype 3a; n = 1). The HBSAg-reactive sample was HBV DNA positive and genotype A. CONCLUSIONS: These findings highlight the necessity of public policies to control hepatitis B and C infections and emphasize the importance of hepatitis B vaccination in prison environments.


INTRODUCTION: Sex workers (SWs) are vulnerable to HIV, hepatitis, and syphilis coinfection. METHODS: A cross-sectional study was conducted in Tubarao, Laguna, and Imbituba, Southern Brazil. We surveyed 147 SWs using face-to-face interviews and blood sampling for serological evaluation. RESULTS: Prevalence of hepatitis B (HBV) was 23.1%, syphilis 19.7%, hepatitis C (HCV) 8.8%, and HIV 8.8%. Of 13 HIV-infected patients, 3 were co-infected with HCV, 4 with syphilis, and 5 with HBV. CONCLUSIONS: SWs had high HIV infection rates, and coinfection with viral hepatitis and syphilis.


In this study, the prevalence, genotype frequency, and risk factors for HCV infection in 384 cocaine users were determined. One hundred twenty-four (32.3%) cocaine users had anti-HCV antibodies and 120 (31.3%) had HCV-RNA. Genotyping results indicated the predominance of genotypes 1 (73.3%) and 3 (26.7%). Multivariate analysis showed an association of HCV infection with tattoos, shared use of paraphernalia, daily cocaine use, and a long history of cocaine use. The epidemiological aspects of HCV infection among cocaine users presented here should serve as an incentive for the establishment of a program of hepatitis C prevention and control by the local public-health authorities in the Amazon.


INTRODUCTION: Little information regarding hepatitis B virus (HBV) and hepatitis C virus (HCV) infections among Brazilian female prisoners exists. This study investigated the prevalence and risk factors associated with HBV and HCV infections and identified viral genotypes among female prisoners in Goias, Central Brazil. METHODS: Women incarcerated in the largest prison in the State of Goias were invited to participate in the study. All female prisoners were interviewed and tested for the detection of hepatitis B surface antigen (HBsAg), antibodies against HBsAg (anti-HBs), against hepatitis B core antigen (anti-HBc), and antibody against HCV (anti-HCV) by ELISA. HBsAg and anti-HCV positive samples were tested for HBV DNA and HCV RNA and genotyped, respectively. RESULTS: Participants (n = 148; 98.6%) completed the study with an overall HBV prevalence of 18.9%. Age >30 years, a low education level, sex with a sexually transmitted diseases carrier, and a male sexual partner serving in the same penitentiary were associated with HBV infections. Only 24% of the women were anti-HBs positive suggesting previous HBV vaccination. Nine female prisoners (6.1%) were anti-HCV positive. Age >40 years, injecting drug use and length of incarceration were statistically associated with anti-HCV antibodies. Five samples were HCV RNA positive and classified as genotypes 1 (subtypes 1a; n = 3 and 1b; n = 1) and 3 (subtype 3a; n = 1). The HBSAg-reactive sample was HBV DNA positive and genotype A. CONCLUSIONS: These findings highlight the necessity of public policies to control hepatitis B and C infections and emphasize the importance of hepatitis B vaccination in prison environments.


PURPOSE: To ascertain the seroprevalence of human immunodeficiency virus (HIV), hepatitis B (HBV), toxoplasmosis and rubella infections in pregnant women in northwestern Parana. METHODS: We conducted a retrospective study based on the results of serological screening during prenatal care of 1,534 patients during the first half of 2010. We included only results from the first prenatal exam and with a simultaneous search for IgG and IgM antibodies to rubella and toxoplasmosis. Serology was performed by microparticle enzyme immunoassay (MEIA). Data were analyzed statistically by the chi(2) test, with the level of significance set at 5%. RESULTS: HIV positivity was 0.3%, positivity of HBV serology (HbsAg) was 0.5%, reactivity to IgM antibodies to Toxoplasma gondii was 1.1%, and reactivity to IgG antibodies was 59.0%. For rubella, no patient was positive for IgM, and IgG reactivity was 99.6%. Data analysis showed no statistical association between seroprevalence and patient age, except for the frequency of anti-T. gondii IgG, which was higher in the 30 to 44 year age group. CONCLUSION: The prevalence of these infectious diseases in pregnant women from northwestern Parana is comparable to that observed in other regions of Brazil.
**OBJECTIVE:** To perform a systematic review of the prevalence of the HCV/ S. mansoni co-infection and associated factors in Schistosoma mansoni -infected populations. METHODS: The bibliographic search was carried out using the Medline, Lilacs, SciELO, Cochrane Library and Ibeccs databases. The criteria for the studies’ selection and the extraction data were based on systematic review methods. Forty five studies were found, with nine being excluded in a first screening. Thirteen articles were used for data extraction. RESULTS: The HCV infection rates in schistosomiasis populations range from 1% in Ethiopia to 50% in Egypt. Several studies had poorly defined methodologies, even in areas characterized by an association between hepatitis C and schistosomiasis, such as Brazil and Egypt, which meant conclusions were inconsistent. HCV infection rates in schistosomotic populations were heterogeneous and risk factors for acquiring the virus varied widely. CONCLUSIONS: Despite the limitations, this review may help to identify regions with higher rates of hepatitis C and schistosomiasis association. However, more studies are necessary for the development of public health policies on prevention and control of both diseases.


**OBJECTIVE:** To estimate the prevalence of hepatitis C using a rapid hepatitis C virus (HCV) test in an inmate population from the countryside of Rio Grande do Sul, Brazil. METHODS: Through a descriptive study, 195 inmates were evaluated by random sampling. RESULTS: A total of 9.7% of the inmates were positive. In this analysis, the variable injectable drug use was predictive of HCV infection. CONCLUSION: The high prevalence of positive serology for HCV observed among the inmates is of particular concern, as it is much higher than in the general population. Therefore, it is necessary to conduct specific approach campaigns to gather more information on infectious diseases in prison settings, as well as to provide appropriate treatment to prevent viral dissemination.


**INTRODUCTION:** By the nature of their activities, firefighters are exposed to a high risk of contracting hepatitis B virus (HBV) as most of the Fire Brigade occurrences in Campo Grande, State of Mato Grosso do Sul (MS), Brazil, are related to the rescue of victims of traffic accidents and the transportation of clinical and psychiatric emergencies. The aim of this study was to investigate the seroepidemiological profile of HBV infection in firefighters from the City of Campo Grande, central Brazil. METHODS: The research involved 308 firefighters. After giving written consent, they were interviewed and blood was collected for the detection of HBsAg, anti-HBs and total anti-HBc of enzyme-linked immunosorbent assays (ELISA). RESULTS: The participants had an average of 36.4 years of age (SO +/- 6.5), being 89.9% male. Blood tests revealed 6.5% of seropositivity for hepatitis B (HB) infection (n=20), and 1% for HbsAg. Isolated anti-HBs markers, indicative of vaccine immunity, were found in 66.9% of the participants and 28.2% were susceptible to infection. With regard to risk factors for HB infection, multivariate regression analysis showed a statistically significant association with length of service; and prevalence was higher in individuals with over 20 years of service. CONCLUSIONS: The prevalence of HB found among the firefighters was low and length of time in the profession was found to be a risk factor. Non-occupational risk factors did not influence the occurrence of HB infection in the population studied.


**INTRODUCTION:** Hepatitis B virus (HBV) infection is one of the most serious public health problems in the world. In Brazil, HBV endemicity is heterogeneous, with the highest disease prevalence in the North region. METHODS: A total of 180 samples were analyzed and subjected to polymerase chain reaction (PCR) and semi-nested PCR of the HBV S-gene, with the aim of determining the prevalence of HBV-DNA (deoxyribonucleic acid) in indigenous groups inhabiting the areas near the Curuca and Itaquai Rivers in the Javari Valley, State of Amazonas, Brazil. RESULTS: The prevalence of the HBV-DNA S-gene was 51.1% (92/180). The analysis found 18 of 49 (36.7%) samples from the Marubo tribe, 68 of 125 (54.4%) from the Kanamary, and 6 of 6 (100%) from other ethnic groups to be PCR positive. There was no statistically significant difference in gender at 5% (p=0.889). Indigenous people with positive PCR for HBV-DNA had a lower median age (p=0.001) of 23 years. There was no statistical difference found in relation to sources of contamination or clinical aspects with the PCR results, except for fever (p=0.001). The high prevalence of HBV-DNA of 75% (15/20) in pregnant women (p=0.009) demonstrates an association with vertical transmission. CONCLUSIONS: The results confirm the high prevalence of HBV-DNA in the Javari Valley, making it important to devise strategies for control and more effective prevention in combating the spread of HBV.

OBJECTIVES: The authors estimate the prevalence of HIV, syphilis, hepatitis B virus (HBV) and herpes simplex virus (HSV-2) infection in patients with psoriasis in a Brazilian reference center. 

INTRODUCTION: Hepatitis C is the major cause of liver transplantation and hepatocellular carcinoma and shows a global prevalence of 3%. Hepatitis C virus (HCV) is associated with extrahepatic manifestations (e.g., cutaneous affections) and psoriasis has been reported as a comorbidity. However, there are few studies analyzing this association. OBJECTIVES: 1) To evaluate anti-HCV prevalence (confirmed by the detection of HCV-RNA) in patients with psoriasis and its potential clinical implications; 2) to analyze the prevalence of other infections in this population: hepatitis B virus (HBV), human T lymphotropic virus, subtypes I and II (HTLV I/II), and human immunodeficiency virus, subtypes I and II (HIV I/II). METHODS: This is a cross sectional study that included patients older than 18 years-old with psoriasis from a Teaching Hospital in Salvador, Bahia. An epidemiological questionnaire was administered and serological tests were performed: surface HBV antigen (HBsAg), antibodies to HBsAg (anti-HBs), anti-HTLV VI/II, anti-HIV I/II, and anti-HCV. Anti-HCV positive results were confirmed by HCV-RNA detection and viral genotype was determined. Skin lesions were evaluated using the Psoriasis Area and Severity Index (PASI). Liver biopsies were analyzed according to the METAVIR score. RESULTS: From the 140 patients included in the study, 7.1% were anti-HCV positive confirmed by the detection of HCV RNA. This prevalence was higher than that in the city of Salvador (1.5%). Other serological results were: HBsAg 0%, anti-HBs 25.8%, HTLV I/II (0.9%), and HIV I/II 0%. PASI score was higher in positive anti-HCV patients than in their negative counterparts (19.5 versus 13.4). Histopathological analysis showed 66.7% of patients with METAVIR F3/F4.

CONCLUSION: Anti-HCV prevalence was higher in psoriasis patients than in the general population of the city. More severe skin lesions were found in HCV patients.


OBJECTIVE: To identify factors associated with vaccination against hepatitis B among healthcare workers. METHODS: This was a cross-sectional study on 1,808 public-sector healthcare workers in Belo Horizonte, Southeastern Brazil, in 2009. A self-administered questionnaire was used and the vaccination situation was analyzed taking sociodemographic characteristics, lifestyle and working conditions and characteristics into consideration. Univariate (p < 0.20) and multiple (p < 0.05) statistical analyses were performed using Poisson regression to evaluate factors associated with vaccination. RESULTS: Of the workers, 85.6% declared that they had been vaccinated, although only 74.9% of the vaccinated professionals had received a complete immunization schedule. Not having been vaccinated was associated with not having a partner; having high school, technical or incomplete higher education level; work characteristics such as working in surveillance or the administrative/general services sector; and not using personal protection equipment. CONCLUSIONS: Groups with lower vaccination coverage were identified. Efforts are required to ensure access and adherence to vaccination among healthcare workers, such as awareness-raising mechanisms.


INTRODUCTION: Viral hepatitis is a major public health concern in Brazil. There are few past studies on this issue, especially among riparian communities. This study aims at determining the seroprevalence of viral hepatitis B and C in the riparian community of Pacuí Island, within the Cameta municipality of Para State, Brazil. Moreover, this study aims to investigate the principal risk factors that this community is exposed to. METHODS: The current study has accessed blood samples from 181 volunteers who have answered an epidemiological questionnaire. Analyses on serological markers have been tested with commercial ELISA kits for detecting HBsAg, total anti-Hbc, anti-HBs, and anti-HCV. Within seroreactive patients for HCV, RT-PCR and line probe assay have been performed to identify the viral genotype. RESULTS: In the serological marker analysis for hepatitis B, no reactivity for HBsAg, total anti-Hbc, rate of 1.1% for total anti-Hbc, and rate of 19.3% for anti-HBs have been observed. On hepatitis C, 8.8% seroprevalence has been found, in which 62.5% have gotten viral RNA. Among the risk factors studied, the following have been highlighted: non-use of condoms, sharing of cutting instruments, use of illicit drugs, and reports of family disease with HBV or HCV. CONCLUSIONS: The vaccination coverage against HBV is low, and the high prevalence of HCV within this community has been observed.


OBJECTIVES: The authors estimate the prevalence of HIV, syphilis, hepatitis B virus (HBV) and herpes simplex virus type-2 (HSV-2) infection and correlates of HBV and HSV-2 infection among truck drivers crossing the southern Brazilian border at Foz do Iguaçu. METHODS: Between October 2003 and March 2005, 1945 truck drivers were sampled while accessing voluntary counselling and testing services; 1833 (94.2%) were tested for HIV (ELISA and confirmatory immunofluorescence assay) and syphilis (non-treponemal (VDRL) and treponemal tests (FTA-ABS)). From these, 799 stored sera were tested for HSV-2 (type-specific ELISA test for detection of IgG) and HBV (core antibodies (anti-HBc) with positives tested for surface antigen (HBsAg)). The authors estimate HIV, syphilis, HSV-2
and HBV prevalence and determine socio-demographic and behavioural correlates of HSV-2 infection and HBV exposure. RESULTS: HIV prevalence was 0.3% (95% CI 0.1 to 0.6) and syphilis 4.5% (95% CI 3.6 to 5.4). Among those tested for HBV and HSV-2, 32.3% (95% CI 28.9 to 35.6) had serological evidence of exposure to HBV and 26.6% (95% CI 23.5 to 29.7) tested positive for HSV-2. Factors independently associated with HBV exposure included increasing age, Brazilian nationality and unprotected anal sex. Increasing age and reporting an unknown number of lifetime partners were associated with HSV-2 infection. CONCLUSIONS: In this sample of truck drivers in southern Brazil, HIV prevalence was lower than national population estimates; exposure to HBV was higher than population estimates, while per cent positive for HSV-2 was similar to population estimates. The low prevalence of HIV in truck drivers indicates prevention successes; however, future HIV prevention programming should incorporate HBV vaccination and sexually transmitted infection prevention.


Leprosy and hepatitis B virus (HBV) are highly endemic in some regions of the state of Mato Grosso, in central Brazil. The association of leprosy with HBV and hepatitis C virus (HCV) was assessed using a seroprevalence study and 191 leprosy outpatients were included. Demographic data and the clinical classification of leprosy were recorded. Evidence of previous HBV infection was present in 53 patients (27.7%, 95% confidence interval: 21.9-34.5) and two (1%) were HBsAg positive. Five (2.6%) had antibodies to HCV. The prevalence of previous exposure to HBV was higher than expected for an adult population in central Brazil. In contrast, the prevalence of anti-HCV antibodies was not much higher regarding the age range of participants. HBV markers were associated with a higher number of sex partners and the use of injections without proper sterilisation of the syringes. The number of HBV carriers was small, suggesting that there was no increased likelihood of chronification among these patients.


INTRODUCTION: This study aimed to estimate the prevalence of HBV infection and associated factors among prison inmates in Campo Grande, MS. METHODS: A total of 408 individuals were interviewed regarding sociodemographic characteristics, associated factors and HBV vaccination using a standardized questionnaire. Blood samples were collected from all participants and serological markers for HBV were detected by enzyme-linked immunosorbent assay. Hepatitis B surface antigen (HBsAg) and/or antibodies against hepatitis B core antigen (anti-Hbc) positive samples were tested for HBV-DNA by polymerase chain reaction. RESULTS: The overall prevalence of HBV infection was 17.9% (95%CI: 14.4-22.0). The HBsAg carrier rate was 0.5%; 56 (13.7%) individuals had been infected and developed natural immunity and 15 (3.7%) were positive for anti-HBc only. Ninety eight (24%) prisoners had only anti-HBs, suggesting that they had low vaccine coverage. An occult HBV infection rate of 0% was verified among anti-HBc-positive individuals. Multivariate analysis of associated factors showed that age > 35 years-old, low schooling level and illicit drug use are significantly associated with HBV infection. CONCLUSIONS: Analysis of the data showed HBV infection prevalence similar or slightly lower than that reported in other of Brazilian prisons. Independent predictors of HBV infection in this population include older age, low schooling level and illicit drug use.


Hepatitis C virus (HCV) is the major infectious disease agent among injecting drug users (IDUs), with seroprevalence ranging from 50-90%. In this paper, serological and virological parameters were investigated among 194 IDUs, 94 ex-IDUs and 95 non-IDUs that were sampled by the "snowball" technique in three localities renowned for both intense drug use and trafficking activities in Salvador, Brazil. The majority of the participants were male, but sex and mean age differed significantly between IDUs/ex-IDUs and non-IDUs (p < 0.05). Anti-HCV screening revealed that 35.6%, 29.8% and 5.3% of samples from IDUs, ex-IDUs and non-IDUs, respectively, were seropositive. HCV-RNA detection confirmed that the prevalence of infection was 29.4%, 21.3% and 5.3% for IDUs, ex-IDUs and non-IDUs, respectively. Genotyping analysis among IDUs/ex-IDUs determined that 76.9% were infected with genotype 1, 18.5% with genotype 3 and 4.6% with a mixed genotype; this result differed significantly from non-IDUs, where genotype 3 was the most frequent (60%), followed by genotype 1 (20%) and a mixed genotype (20%). We report a significantly higher prevalence of HCV infection in IDUs/ex-IDUs compared to the control group (p < 0.001). Although the sample size of our study was small, the differences in HCV genotype distribution reported herein for IDUs/ex-IDUs and non-IDUs warrant further investigation.


The aim of this study was to determine the prevalence and the incidence of hepatitis B virus (HBV) among...
haemodialysis (HD) subjects and to evaluate whether testing for serological markers at the time of admission is suitable for HBV screening in this population. One hundred twenty-three patients belonging to two HD centres from Sao Paulo, Brazil, were tested prospectively. HBV DNA was detected by polymerase chain reaction (PCR) in each of the prospective subjects \( (n = 123) \) during one year. Additionally, all samples \( (n = 1,476) \) were analysed for HBV serological markers. The prevalence of hepatitis B core antibody (anti-HBc), hepatitis B surface antigen (HBsAg) and HBV DNA were 34.1%, 15.4% and 8.1%, respectively, while the incidence was null. Fluctuation in HBV serology was observed in one patient. Only 37.8% \( (17/45) \) of cases responded to the HBV vaccine. Our results suggest that employing more than one HBV marker and repeated follow-up evaluations may improve HBV screening in HD units.


Intravenous drug injection has been reported as the main risk factor for hepatitis C virus (HCV) infection. The aim of the present study was to describe the prevalence and the epidemiological profile of HCV infection among abusers of illegal injected and non-injected drugs in Cuiaba, state of Mato Grosso, Central Brazil. A cross-sectional study including 314 male drug users from eight detoxification centres was performed. Out of 314 subjects studied, 48 \( (15.2\%) \) were intravenous drug users. Participants were interviewed and had blood samples taken and tested for the presence of anti-HCV antibodies. Positive samples were tested for the presence of HCV RNA. Genotyping was performed on HCV RNA-positive samples. The overall prevalence of anti-HCV antibodies was 6.4\% \( (n = 20) \). Out of 20 anti-HCV antibody-positive subjects, \( 16 \) (80\%) were also HCV RNA-positive. Genotype 1 predominated \( (75\%) \), followed by \( 3a \) (25\%). Subtype \( 1a \) was more common than \( 1b \). HCV infection was more prevalent among intravenous drug users \( (33\%) \) than non-injecting users \( (1.5\%) \). Logistic regression analyses showed independent associations between HCV infection and intravenous drug use, imprisonment and increasing age. In the present study, injecting drug use was the factor most strongly associated to HCV infection and inhaling or sniffing did not represent an increased susceptibility to infection.


**OBJECTIVE:** To analyse the epidemiological aspects of sexually transmitted diseases (STD) among women who have sex with women (WSW) in Sao Paulo, Brazil. **METHOD:** A cross-sectional study with interviews and analysis of clinical and gynaecological tests in women, by means of a convenience sample. Characteristics were gathered according to age, sociobehavioural profile, reproductive life and sexuality. **RESULTS:** The study included 145 women. They started sexual activity at an average age of 16.9 years, and 23.4\% of them had heterosexual relations during the preceding year, with a relatively low frequency of condom use. In sexual relations with women, 54.5\% used condoms when they shared sex toys. A previous STD was reported by 38\% of them. The following STD were diagnosed: trichomonas \( (3.8\%) \), bacterial vaginosis \( (33.8\%) \), fungi \( (25.6\%) \), Chlamydia \( (1.8\%) \), hepatitis B \( (7\%) \), hepatitis C \( (2.1\%) \), abnormal Pap smear \( (7.7\%) \), human papillomavirus \( (6.2\%) \) and HIV \( (2.9\%) \). **CONCLUSION:** In this study, many WSW did not report a single risk behaviour, but often reported a combination of several potential risk factors. Therefore, one cannot speak of high or low-risk behaviour for STD/HIV, but rather of multiple-risk behaviour. It is evident that there is a need for healthcare professionals to be correctly informed and sensitive towards the healthcare of WSW.


**OBJECTIVE:** To estimate prevalence of hepatitis C virus (HCV) infection and identify risk factors associated and circulating HCV genotypes and subtypes. **METHODS:** Study conducted including 691 drug users attending 26 charitable, private and public drug treatment centers in Goiania and Campo Grande, central-western Brazil, between 2005 and 2006. Sociodemographic characteristics and risk factors for HCV infection were collected during interviews. Blood samples were tested for HCV antibodies (anti-HCV). Positive samples were submitted to HCV RNA detection by PCR with primers complementary to 5' NC and NS5B regions of viral genome and genotyped by line probe assay (LiPA) and direct nucleotide sequencing followed by phylogenetic analysis. The prevalence and odds ratio were calculated with 95\% confidence intervals. Risk factors were first estimated in the univariate analysis \( (p<0.10) \) and then analyzed by hierarchical logistic regression. Statistical significance was assessed at a 5\% significance level. **RESULTS:** The prevalence of anti-HCV was 6.9\% \( (95\% CI: 5.2-9.2) \). The multivariate analysis of risk factors revealed that age over 30 years and injecting drug use were associated with HCV infection. HCV RNA was detected in 85.4\% \( (41/48) \) of anti-HCV-positive samples. Thirty-three samples were genotyped as genotype 1 by LiPA, subtypes 1a \( (63.4\%) \) and 1b \( (17.1\%) \), and 8 samples \( (19.5\%) \) were genotype 3, subtype 3a. The phylogenetic analysis of the NS5B region showed that 17 \( (68\%) \), 5 \( (20\%) \), and 3 \( (12\%) \) samples were subtypes 1a, 3a, and 1b, respectively. **CONCLUSIONS:** The results show a high prevalence of HCV infection and predominance of subtype 1a among drug users in Brazil. In addition, injecting drug use was a major risk factor associated with HCV infection.
Co-infection


The aim of this study is to estimate the prevalence of HIV/HBV and HIV/HCV coinfections among AIDS cases reported in Brazil, and to describe the epidemiological profile of these cases. Coinfection was identified through probabilistic record linkage of the data of all patients carrying the HIV virus recorded as AIDS patients and of those patients reported as carriers of hepatitis B or C virus in various databases from the Brazilian Ministry of Health from 1999 to 2010. In this period 370,672 AIDS cases were reported, of which 3,724 were HIV/HBV coinfections. Women are less likely to become coinfected than men and the chance of coinfection increases with age. This study allowed an important evaluation of HBV/HIV and HCV/HIV coinfections in Brazil using information obtained via merging secondary databases from the Ministry of Health, without conducting seroprevalence research. The findings of this study might be important for planning activities of the Brazilian epidemiologic surveillance agencies.


SUMMARY We studied hepatitis C virus (HCV) prevalence and risk factors for HCV infection in a sample of Brazilian HIV-positive patients. A cross-sectional study was conducted with 580 HIV-positive patients from a specialized HIV/AIDS diagnosis and treatment centre in southern Brazil. All patients were interviewed for socio-demographic and risk factors and tested for HCV antibodies and HCV-RNA detection. A multivariate analysis was performed to identify risk factors for HCV infection. A total of 138 (24%) patients had past or chronic hepatitis C. The following risk factors were associated with HCV infection for each gender: alcohol misuse and injecting drug use in women (P < 0.001) and low educational level, smoking drug use, and injecting drug use in men (P < 0.01). These results suggest that alcohol misuse, low educational level, smoking drug use, and injecting drug use are probable risk factors for HCV infection in HIV-positive patients. This information contributes to an understanding of the epidemiology of HIV/HCV co-infection in Brazil.


Context The occurrence of HIV and hepatitis B (HBV) and C (HCV) virus associations is of great concern since co-infected patients respond poorly to antiviral treatment and usually progress to chronic and more complicated hepatic disease. In Brazil, these co-infections prevalence is not well known since published data are few and sometimes demonstrate conflicting results. Also, a significant number of co-infected individuals are HBV/HCV asymptomatic carriers, leading to under notification. Objectives The present study aimed to determine the prevalence of the HBV and HCV infection in a recently diagnosed HIV population in the state of Ceara/Brazil. Methods Retrospective cohort, with >18yo patients diagnosed HIV+ from 2008-2010. First year medical attention information was collected. Results A total of 1,291 HIV+ patients were included. HBV serologies were collected in 52% (23% had previous hepatitis B, 3.7% were co-infected) and HCV in 25.4% (1.5% had previous hepatitis C, 5.4% co-infection). The majority of HBV/HIV patients referred multiple sexual partners/year, 28% homosexuality and 20% bisexuality. In the HCV/HIV group 38.8% individuals had > one sexual partner/year and 22.2% used intravenous drugs. Conclusion The study reinforce the need for better training healthcare workers and providing laboratory support for a prompt hepatitis diagnosis and adequate medical management to avoid complications and decrease viral spread.


OBJECTIVE: The objective of this study was to verify the prevalence and vertical transmission rate of HIV, syphilis and hepatitis B in pregnant women in the municipality of Itajai, state of Santa Catarina, Brazil, during the 2002-2007 period. METHODS: Data were collected in a retrospective population-based longitudinal study using computerized medical records of the state and local health authorities during the 2002-2007 period for HIV, and 2004-2007 for syphilis and hepatitis B. RESULTS: The prevalence of HIV, acute hepatitis B, chronic hepatitis B and syphilis in pregnant women was 1.7%, 0.41%, 0.46%, and 0.43%, respectively. Overall, vertical transmission of HIV was 6.28%, although it was less than 5% among women diagnosed with HIV before or during pregnancy, compared to 20% and 55% among women first diagnosed with HIV during and after delivery, respectively. Vertical transmission of syphilis was 68.89%. No trend was confirmed for the transmission rate either regarding the year of diagnosis or age group of pregnant women. Almost 44% of HIV infected pregnant women knew their HIV status before becoming pregnant; the HIV transmission rate for these women was less than 5%. No case of vertical transmission was observed for hepatitis B. CONCLUSIONS: The vertical transmission rate for HIV was within the target of the Ministry of Health when HIV diagnosis was made during pregnancy, but increased sharply when the diagnosis was made only at delivery. Vertical transmission of syphilis was much higher than expected, showing
the importance of reinforcing the procedures recommended for its reduction.


Few studies are available on hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) co-infection in populations living in small and medium-sized Brazilian cities. We evaluated the seroprevalence of these viruses in selected individuals from a clinic of infectology, who were referred to the University Regional Hospital of the West Region of state of Sao Paulo, Brazil. Among a total of 7,021 individuals seen in the clinic following receipt of preliminary ELISA results or having the suggested clinical signs of viral hepatitis or HIV, 1,228 were systematically screened. Isolated or associated HBsAg, HCV and HIV antibodies were found in 44.9% of the subjects. Anti-HIV antibodies were found in 24.7% of the patients, 20.3% of whom had an HIV monoinfection and 4.4% of whom were co-infected with hepatitis viruses (HCV: 4%; HBV: 0.4%). Anti-HCV antibodies were found in 14% of the patients and 5.9% had anti-HBsAg antibodies. HCV infection affected males more than females (p < 0.05) and individuals > 50-years old had an increased prevalence of anti-HCV compared to HIV (p = 0.0001) or HBV (p = 0.0063). HCV-RNA was detected in 73.5% of the samples with a predominance of genotype 1 (72.5%). A significant percentage (44.9%) of the selected individuals was positive for antibodies against HBV, HCV and/or HIV; these patients would otherwise have remained undiagnosed.


Twenty-four hepatitis C virus patients coinfected with human T-lymphotropic virus type 1 were compared with six coinfected with HTLV-2 and 55 with HCV alone, regarding clinical, epidemiological, laboratory and histopathological data. Fischer’s discriminant analysis was applied to define functions capable of differentiating between the study groups (HCV, HCV/HTLV-1 and HCV/HTLV-2). The discriminant accuracy was evaluated by cross-validation. Alcohol consumption, use of intravenous drugs or inhaled cocaine and sexual partnership with intravenous drug users were more frequent in the HCV/HTLV-2 group, whereas patients in the HCV group more often reported abdominal pain or a sexual partner with hepatitis. Coinfected patients presented higher platelet counts, but aminotransferase and gamma-glutamyl transpeptidase levels were higher among HCV-infected subjects. No significant difference between the groups was seen regarding liver histopathological findings. Through discriminant analysis, classification functions were defined, including sex, age group, intravenous drug use and sexual partner with hepatitis. Cross-validation revealed high discriminant accuracy for the HCV group.


OBJECTIVE: To estimate the prevalence of hepatitis C virus (HCV) infection and risks factors associated with coinfection in HIV-positive individuals. METHODS: A cross-sectional descriptive study was conducted with 343 HIV patients attended at a university hospital in Recife, Northeastern Brazil, from March to December 2003. A standardized questionnaire about risk factors was administered. Serum samples were analyzed for anti-HCV antibodies using enzyme-linked immunosorbent assay (ELISA), HCV-RNA using reverse transcription-polymerase chain reaction (RT-PCR), and genotyping using the ABI 377 (PE Biosystems). Univariate and multivariate analyses and multiple logistic regression were performed. RESULTS: HCV prevalence was 4.1% (14/343) using ELISA and 3.2% (11/343) using RT-PCR. The most common genotypes were 1b (45%), 3 (33%) and 1a (22%). Co-infection was higher among those aged 30 to 39 years, and predominantly in males (64.3 %). In the multiple logistic regression, the variable blood transfusion was the single remaining risk factor for HCV (OR=4.28; 95% CI 1.44;12.73). CONCLUSIONS: The prevalence of HIV/HCV coinfection was low. Blood transfusion was a risk factor and HCV genotype 1b was the most frequently found.

### 3.5 Prevention and Control of viral hepatitis in Brazil

Pubmed MEDLINE search on (hepatitis OR HAV OR HBV OR HCV OR HDV OR HEV) AND (epidemiology OR prevention OR vaccin OR vaccination OR control OR surveillance OR prevalence OR diagnosties) AND (Brazil OR Brasil) NOT autoimmune in all fields, was performed. In End NOTE a second search was done on [Brazil AND PREVENTION OR CONTROL OR TREATMENT] After a manual search only the references and the abstracts really related to the subject were selected and classified. The references ar ranged by publication year (most recent first) and for each year in alphabetical order of the first author’s name.
Prevention


The study aimed to evaluate vaccination coverage and factors associated with incomplete basic vaccination schedule at 12 months of age in 427 children aged 12-59 months in Sao Luis, Maranhao State, Brazil, 2006. This cross-sectional, population-based household survey used complex cluster sampling. Poisson regression with robust adjustment of variance was applied. Complete basic vaccination coverage was 71.9% for applied doses, 61.8% for valid doses, and 23.6% for correct doses. Hepatitis B and tetravalent vaccines showed higher percentages of doses on dates or at intervals lower than recommended. Percentages of delayed vaccination were high, except for BCG. Incomplete basic vaccination was more frequent in girls and children from low-income and black families. Racial, gender, and socioeconomic factors posed barriers to complete vaccination, thus emphasizing the need for policies to address such inequalities.


A strategy adopted by different countries to reduce the number of new cases of hepatitis A is the vaccination. However, the mosaic of the epidemiological profile in developing countries has hampered the establishment of a unified nationwide vaccination program. To determine national vaccination policies, the results of epidemiological studies need to be carefully considered. For this monitoring, the use of oral fluid is very important due to the painless and non-invasive collection characteristics. There are few studies investigating which oral fluid collection device is optimal to detect low antibody levels and its use in selecting individuals for vaccination. So, the present study aimed to evaluate different oral fluid collection devices to detect humoral immune response against hepatitis A virus and its application in epidemiological studies. Therefore, 90 matched serum and oral fluid samples were collected from volunteers with different immune status, under ideal conditions of collection (optimization panel); and 224 matched samples in difficult-to-access areas (epidemiological study). Serum was collected by venipuncture and the oral fluid was obtained using three commercial devices: Salivette(R), OraSure(R) and ChemBio(R). Serum and oral fluid were submitted to a commercial immunoblot to detect total anti-HAV antibodies. The optimization panel demonstrated that ChemBio(R) device had the best performance (100% agreement), followed by OraSure(R) (95.4%) and Salivette(R) (90.8%). The optimal collection device (ChemBio(R)), tested in a difficult-to-access area and evaluated under precarious conditions of collection, showed similar prevalence of total anti-HAV between serum and oral fluid, 80.8% and 79%, respectively. A follow-up was performed to evaluate the stability of oral fluid and it was observed that 210 days after the collection it was possible to detect anti-HAV antibodies. Oral fluid can be used to detect low levels of specific-antibody, being important to select age groups to be vaccinated. Therewith, the choice of proper collection device is essential to evaluate HAV antibodies in the epidemiological scenario.


OBJECTIVE: We calculated the prevalence and studied the factors associated with hepatitis B vaccination. Reasons for non-vaccination among dentists were investigated. METHODS: A cross-sectional study was performed in Montes Claros, Minas Gerais, from 2007 to 2008, to assess hepatitis B vaccination among practicing dental surgeons. Variables were evaluated using a previously tested structured questionnaire. Data underwent descriptive analysis. Non-conditional logistic regression was used to determine the variables associated with hepatitis B vaccination (p < 0.05). RESULTS: There were 333 subjects eligible for the study, 297 (89.2%) participated, and 283 answered the question about vaccination; of these, 258 (91.2%) completed the three-dose schedule vaccination and 25 (8.8%) were not vaccinated or did not complete the vaccination schedule. Lack of information (48%) was stated as the main reason for not being vaccinated. Variables associated with vaccination were: tobacco use (OR = 2.50; IC95% = 1.22-7.13), alcohol consumption (OR = 2.99; IC95% = 1.16-7.74), satisfaction with the profession (OR = 4.62; IC95% = 1.50-8.25) and knowledge on the post-exposure management protocol (OR = 4.28; IC95% = 1.63-9.26). CONCLUSIONS: We found a high prevalence of complete vaccination among dentists in Montes Claros. It is higher among professionals who do not use tobacco and alcohol, are more satisfied with their profession and know the protocol after occupational exposure. The study suggests that the lack of information is the main reason for not being vaccinated.

Pereira, Z. T. and Mendoza-Sassi, R. A. "[Factors associated with the immune response to hepatitis B vaccine in Brazilian hemodialysis patients]." Rev Med Chil 2012 140(7): 882-888.
BACKGROUND: Patients on chronic hemodialysis have a lower immune response to vaccination against hepatitis B virus (HBV) than the general population. AIM: To identify factors that may interfere with immunization against hepatitis B virus (HBV) in Brazilian hemodialysis patients and analyze the evolution of the level of antibodies.

METHODS: We conducted a population-based seroprevalence study aimed at estimating the HBV prevalence and risk of infection in the rural area of Labreia following nineteen years of HBV vaccination. RESULTS: Half of the subjects showed total anti-HBc of 52.1% (95% CI 49.6-54.7). The HBsAg prevalence was 6.2% (95% CI 5.1-7.6). Multivariate analysis showed an inverse association between HBV infection and vaccination (OR 0.62; 95% CI 0.44-0.87); HBsAg remained independently associated with past hepatitis (OR 2.44; 95% CI 1.52-3.89) and inversely to vaccination (OR 0.43; 95% CI 0.27-0.69). The prevalence of HBeAg among HBsAg-positive individuals was 20.4% (95% CI 12.8-30.1), with the positive subjects having a median age of 11 years (1-46) p=0.0003.

CONCLUSIONS: We demonstrate that HBV infection is still an important public health issue and that HBV vaccination could have had better impact on HBV epidemiology. If we extrapolate these findings to other rural areas in the Brazilian Amazon, we can predict that the sources of chronic infected patients remain a challenge. Future studies are needed regarding clinical aspects, molecular epidemiology, surveillance of acute cases, and risk groups.


The aim of this study was to present the contributions of the systematic review of economic evaluations to the development of a national study on childhood hepatitis A vaccination. A literature review was performed in EMBASE, MEDLINE, WOPEC, HealthSTAR, Scielo and Lilacs from 1995 to 2010. Most of the studies (8 of 10) showed favorable cost-effectiveness results. Sensitivity analysis indicated that the most important parameters for the results were cost of the vaccine, hepatitis A incidence, and medical costs of the disease. Variability was observed in methodological characteristics and estimates of key variables among the 10 studies reviewed. It is not possible to generalize results or transfer epidemiological estimates of resource utilization and costs associated with hepatitis A to the local context. Systematic review of economic evaluation studies of hepatitis A vaccine demonstrated the need for a national analysis and provided input for the development of a new decision-making model for Brazil.


The protective anti-HBs titres were examined six-year post-immunisation with the Brazilian recombinant hepatitis B vaccine. After the primary vaccination, all adolescents (n = 89) responded with protective anti-HBs titres and had a geometric mean titre (GMT) of 4031.8 mIU/mL. In 2010, 94.5% maintained protective anti-HBs (> 10 mIU/mL) antibodies, with a GMT of 236.0 mIU/mL. A positive correlation was observed between the anti-HBs titres after the primary vaccination and the titres at the six-year follow-up (p < 0.01). Eleven subjects showed anti-HBs titres suggestive of a natural booster. Prostitution and tattoos/piercings were marginally associated with natural boosters in the multivariate analysis. This study showed the first data on anti-HBs persistence following the Brazilian hepatitis B vaccine in sexually active individuals and highlights its effectiveness in the medium term.


OBJECTIVE: To identify factors associated with vaccination against hepatitis B among healthcare workers.

METHODS: This was a cross-sectional study on 1,808 public-sector healthcare workers in Belo Horizonte, Southeastern Brazil, in 2009. A self-administered questionnaire was used and the vaccination situation was
analyzed taking sociodemographic characteristics, lifestyle and working conditions and characteristics into consideration. Univariate (p < 0.20) and multiple (p < 0.05) statistical analyses were performed using Poisson regression to evaluate factors associated with vaccination. RESULTS: Of the workers, 85.6% declared that they had been vaccinated, although only 74.9% of the vaccinated professionals had received a complete immunization schedule. Not having been vaccinated was associated with not having a partner; having high school, technical or incomplete higher education level; work characteristics such as working in surveillance or the administrative/general services sector; and not using personal protection equipment. CONCLUSIONS: Groups with lower vaccination coverage were identified. Efforts are required to ensure access and adherence to vaccination among healthcare workers, such as awareness-raising mechanisms.


Age-related seroprevalence studies that have been conducted in Brazil have indicated a transition from a high to a medium endemicity of hepatitis A virus (HAV) infection in the population. However, most of these studies have focused on urban populations that experience lower incidence rates of HAV infection. In the current study, the prevalence of anti-HAV antibodies was investigated in children with a low socioeconomic status (SES) that live on the periphery of three capital cities in Brazil. A total of 1,162 dried blood spot samples were collected from individuals whose ages ranged from one-18 years and tested for anti-HAV antibodies. A large number of children under five years old (74.1-90%) were identified to be susceptible to HAV infection. The anti-HAV antibody prevalence reached >/= 50% among those that were 10-14 years of age or older. The anti-HAV prevalence rates observed were characteristics of regions with intermediate level of hepatitis A endemicity. These data indicated that a large proportion of children with a low SES that live at the periphery of urban cities might be at risk of contracting an HAV infection. The hepatitis A vaccine that is currently offered in Brazil is only available for high-risk groups or at private clinics and is unaffordable for individuals with a lower SES. The results from this study suggest that the hepatitis A vaccine should be included in the Brazilian National Program for Immunisation.


INTRODUCTION: Vaccination is the main tool for preventing hepatitis B virus (HBV) infection; however, following the completion of the vaccination series, the concentrations of anti-HBs can decline over the years and reach levels less than 10mIU/mL. The persistence of protection in these individuals is still unknown. The present study aimed to determine the anti-HBs antibody levels among children and adolescents who had received a complete vaccination course for hepatitis B. METHODS: Antibodies against HBV surface antigen (anti-HBs) were tested in 371 individuals aged 10 to 15 years-old. RESULTS: Volunteers who showed undetectable quantities of anti-HBs accounted for 10.2% of the population studied and 39.9% presented antibody titers of less than 10mIU/mL. Anti-HBs >/= 10mIU/mL were verified in 49.9%. CONCLUSIONS: These results corroborate other studies indicating levels of anti-HBs below 10mIU/mL in vaccinated individuals. Additional studies are required to assess whether this indicates susceptibility to HBV infection and the need and age for booster doses.


INTRODUCTION: Hepatitis B infection constitutes an important cause of morbidity and mortality worldwide. In Brazil, however, the current epidemiological situation is not clear. Considering the importance of establishing this prevalence, the aim of this study was to determine the prevalence of HBV markers in voluntary adolescents, junior high (secondary school) students, in the City of Itajai, State of Santa Catarina, Brazil. METHODS: A seroepidemiological, transverse study was conducted with 353 randomly chosen adolescents from elementary school in 2008. Blood samples were analyzed for HBsAg, anti-HBc and anti-HBs. All analyses were conducted by automated microparticle enzyme immunosorbert assay (Abbott(R), AxSYM system, Deerfield, IL, USA), according to the manufacturer’s instructions. RESULTS: The prevalence of HBsAg was 0.6% (CI 95% 0.1 - 2.0), that of anti-HBc was 1.1% (CI 95% 0.3 - 2.9) and that of detectable anti-HBs was 83.6% (CI 95% 79.3 - 87.3). Hepatitis B vaccination coverage was 97.5% (CI 95% 95.2 - 98.8). CONCLUSIONS: These results demonstrate the success of the vaccination program against hepatitis B in the region studied and indicate that prevention strategies must be maintained and, if possible, expanded to contribute to the establishment of positive prevalence rates in all age groups.


This article assesses the historical context and the conceptual frame of setting up damage containment programs in the field of public health, with special emphasis on the Brazilian experience. The survey seeks to assess the
relevance of such programs in the ongoing efforts to curb the spread of blood-borne and sexually transmitted infections, especially AIDS and hepatitis C. Findings from both the Brazilian and the international literature demonstrate that practical damage containment initiatives tend to be more effective when integrated with other public health measures based on common goals. Damage containment initiatives, aligned with the basic principles of public health do not limit themselves to a priori models or health care per se. They encompass a variety of pragmatic measures based on public policies and should be in line with the demands of the communities since the moment of their inception and implemented in the context of full partnership with such communities.


OBJECTIVE: To evaluate the immunogenicity and safety of a novel hepatitis B vaccine, after increasing antigen concentration to 25 µg, in comparison to the reference vaccine. METHODS: Single-blinded randomized trial comparing VrHB-IB (Instituto Butantan) and the reference vaccine (Engerix B(R), Glaxo Smith Kline). Volunteers aged 31 to 40 years were randomized to either experimental (n=216) or control (n=203) groups, and were given three doses of vaccine. The first dose was administered upon recruitment, and the second and third doses 30 and 180 days later, respectively, between 2004 and 2005. Blood samples were collected for analysis before randomization and after the second and third doses. Active search for adverse effects was performed in the first five days after vaccination. Differences were evaluated using chi-square and Fisher's exact tests, with a 5% significance level. RESULTS: No severe adverse effects were observed. Seroprotection was confirmed in 98.6% (213/216) of volunteers in the experimental group and 95.6% (194/203) of those in the control group. Geometric mean titers were 12,557 and 11,673, respectively. CONCLUSIONS: The Brazilian vaccine was considered to be equivalent to the reference vaccine and its use is recommended for adults.


OBJECTIVE: To analyze the efficacy and safety of a recombinant Hepatitis B vaccine in newborns. METHODS: The study was carried out in a general hospital in the city of Guarulhos, Southeastern Brazil, between 2002 and 2005. The recombinant Hepatitis B vaccine from Instituto Butantan (VrHB-IB) was tested in two clinical trials. In both trials, newborns were randomly allocated to the experimental or control (reference vaccine) groups. Newborns were given three doses of vaccine, one up to 24 hours after birth and the other two 30 and 180 days later. In the first trial, 538 newborns completed the immunization protocol, and 486 in the second. Vaccines were considered equivalent when seroprotection difference was below 5%. RESULTS: Seroprotection in the first trial (anti-HBs > or = 10mUI/ml) was 92.5% (247/267) in the experimental group, compared to 98.5% (267/271) in the control (p = 0.001). With this result, VrHB-IB did not fulfill the pre-established criterion for equivalence. After increasing the concentration of antigen in the vaccine to 25 microg, seroprotection reached 100% in the experimental group and 99.2% in the control. No severe adverse effects were recorded. CONCLUSIONS: The reformulated VrHB-IB is considered equivalent to the reference vaccine, and its use is recommended in newborns.


Infant exposure to ethylmercury (EtHg) has not only increased but is starting earlier as a result of the current immunization schedule that uses thimerosal-containing vaccines (TCVs). Although vaccination schedule varies considerably between countries, infants in less-developed countries continue to be exposed to EtHg derived from more affordable TCVs. We studied the exposure of newborns to EtHg from hepatitis B vaccines; hospital records (21,685) were summarized for the years 2001 to 2005 regarding date of birth, vaccination date, and birth weight. Most of the vaccinations occurred in the first 24 hours postdelivery; over the 5 years, there was an increase in vaccinations within hours of birth (same day), from 7.4% (2001) to 87.8% (2005). Nearly 94.6% of infants are now being vaccinated within the first 24 hours. Range of mercury exposure spread from 4.2 to 21.1 microg mercury/kg body weight for those receiving TCVs with the highest thimerosal concentration; these exposure levels are conservative for 2% of children receiving vaccines within 2 to 3 postnatal days, when they are still going through physiological postnatal weight loss. Because of the particular timing (transitioning from in utero to ex utero metabolism) and specific aspects of exposure (i.e., parenteral mode, bypassing gastroenteric barriers) and dose (related to vaccine manufacturer and with variation in birth weight), this study reveals critical issues that can modulate toxicokinetics and toxicodynamics of organomercurials in neonates.


Compliance with and responses to the hepatitis B vaccine were evaluated in remaining quilombo communities in Central Brazil. A total of 708 individuals who were susceptible to hepatitis B virus infection were invited to participate in the hepatitis B vaccination program in eight communities. Although 567 (80%) individuals received the first dose, only 198 (28%) complied with the full vaccination scheme. Of 148 subjects who agreed to be tested for anti-HBs, 123 (83.1%; 95%CI: 75.9-88.6) responded to the vaccine. A geometric mean titer of 512mlU/mL.
INTRODUCTION: Self-report on the quality of life (QOL) is increasingly studied in the evaluation of various diseases, especially in chronic ones. However, there are few data in the literature focusing the QOL of patients living with chronic hepatitis C. The objective of this study was to evaluate QOL in patients with hepatitis C assessed by the World Health Organization Quality of Life Assessment (WHOQOL)-bref scale. METHODS: One hundred and eight hepatitis C patients attending the Outpatient Healthcare Medical Specialties in Tubarao, State of Santa Catarina, Brazil, were contacted from May 2010 to February 2011. Patients answered the WHOQOL-bref scale and a questionnaire about their treatment and risk factors to hepatitis C virus (VHC) infection. RESULTS: Although most of patients with chronic hepatitis C considered their QOL good or very good (58.1%), 47 (44.8%) patients were poorly or very poorly satisfied with their health. About the WHOQOL answers, the environment domain had the highest score (25.15 + 5.77), while the lowest score was the social relationships domain (9.19 + 2.5). There was statistically significant association between household income and quality of life in all domains (p<0.001) and statistically significant association between education and the physical, psychological and social domains of quality of life (p<0.05). CONCLUSIONS: Based on the answers given in WHOQOL-bref, patients with chronic hepatitis C have a generally poor QOL, especially in social relationship domain. Household income and educational level were factors that interfered significantly with patients' QOL assessment.


BACKGROUND: Hepatitis C is a leading cause of mortality among HIV-infected individuals. Therefore, eradication of HCV in this population is a priority. There are scarce data regarding retreatment efficacy of HIV/ HCV coinfected patients. The aim of our study was to evaluate efficacy, predictors of response, and long term clinical benefits of sustained virological response (SVR) after hepatitis C retreatment in a population of HIV/HCV coinfected patients. MATERIAL AND METHODS: We evaluated efficacy, safety, and clinical benefits of peginterferon(alfa-2a or alfa-2b) and ribavirin in a retrospective, observational, multicentric study, including 47 HIV/HCV coinfected patients, non-responders to previous treatment with conventional interferon alfa-2a and ribavirin. The primary endpoint of efficacy was SVR, defined as undetectable viral load 24 weeks after end of treatment. Death, liver disease progression, CD4 counts, and AIDS defining illness were the endpoints to access clinical benefits of treatment response. RESULTS: In our analysis, 31.9% patients reached SVR. Genotypes 2/3 had a significant better SVR (66.7%) compared to genotypes 1/4 (33.3%) (p = 0.022). During follow-up, deaths (6.89%) and hepatic decompensation (28.6%) occurred only in the nonresponder group, while there were no cases of death or hepatic decompensation among the responder group(p = 0.037). CONCLUSION: Nearly one third of patients (mainly those with genotypes 2/3) reached SVR after hepatitis C retreatment in this group of HIV/HCV coinfected patients. SVR was protective against hepatic decompensation and death in a two-year follow-up period. Retreatment may be an effective and safe way to eradicate HCV until new anti-HCV drugs become available to this group of patients.


OBJECTIVE: To review and compare side effects of hepatitis C treatment with pegylated interferon and ribavirin at the CRIE of the Hospital Mario Covas (Santo Andre), Sao Paulo, Brazil, from February 23 to May 5, 2011. METHODS: Cross-sectional study through questionnaire, with a non-probability sample comprised of 340 patients that had received at least one dose of the medication. RESULTS: Side effects presented were fatigue (82.9%), arthralgia and/or myalgia (76.8%), weight loss (71.8%), headache (67.6%), listlessness (65.9%), depression and/or irritability (64.4%), itching (60.6%), fever (59.1%), alopecia (51.5%), dry cough (34.1%), nausea (11.7%), inappetence (11.7%), and dizziness (7.9%). Up to 19 symptoms were reported during treatment. Only four patients (1.2%) did not present side effects. When comparing the types of interferon, it was observed that alpha-2b caused more fever, weight loss, headache, arthralgia and/or myalgia, fatigue, listlessness, depression and/or irritability, and dry cough than patients using alpha-2a, who had more alopecia and itching. CONCLUSION: The study shows a high morbidity related to the treatment, as only 1.2% of the patients showed no side effects. In the sample, the pegylated interferon alpha-2b was responsible for higher prevalence of fever and weight loss when compared to alpha-2a, and this was a statistically significant relation (p < 0.05).


INTRODUCTION: Self-report on the quality of life (QOL) is increasingly studied in the evaluation of various diseases, especially in chronic ones. However, there are few data in the literature focusing the QOL of patients with chronic hepatitis C. The objective of this study was to evaluate the QOL in patients with hepatitis C assessed by the World Health Organization Quality of Life Assessment (WHOQOL)-bref scale. METHODS: One hundred and eight hepatitis C patients attending the Outpatient Healthcare Medical Specialties in Tubarao, State of Santa Catarina, Brazil, were contacted from May 2010 to February 2011. Patients answered the WHOQOL-bref scale and a questionnaire about their treatment and risk factors to hepatitis C virus (VHC) infection. RESULTS: Although most of patients with chronic hepatitis C considered their QOL good or very good (58.1%), 47 (44.8%) patients were poorly or very poorly satisfied with their health. About the WHOQOL answers, the environment domain had the highest score (25.15 + 5.77), while the lowest score was the social relationships domain (9.19 + 2.5). There was statistically significant association between household income and quality of life in all domains (p<0.001) and statistically significant association between education and the physical, psychological and social domains of quality of life (p<0.05). CONCLUSIONS: Based on the answers given in WHOQOL-bref, patients with chronic hepatitis C have a generally poor QOL, especially in social relationship domain. Household income and educational level were factors that interfered significantly with patients' QOL assessment.


About one-third of people infected with human immunodeficiency virus-1 (HIV-1) are coinfected with hepatitis C virus (HCV) because of shared transmission routes. Studies report that HIV-1 complicates hepatitis C infection by increasing HCV viral load and reducing spontaneous clearance. Single nucleotide polymorphisms (SNPs) upstream of the IL28B gene have been associated with spontaneous and treatment-induced clearance of HCV infection. The aim of this study was to evaluate the association between the SNP rs12979860 of the IL28B gene and spontaneous clearance of HCV infection in a Brazilian HIV-1 population. The SNP was analyzed by polymerase chain reaction (PCR) followed by restriction digestion in 138 anti-HCV-positive patients. Spontaneous clearance was observed in 34 subjects (24.6%). Genotype distribution was significantly different between spontaneous clearance and HCV chronic patients. The CT/TT genotypes conferred a nearly 3-fold increased odds to chronic HCV infection relative to the CC genotype (odds ratio, 2.78; 95% confidence interval, 1.16-6.64; p<0.011). In conclusion, the rs12979860 polymorphism is associated with spontaneous clearance of HCV in HIV-1 Brazilian infected patients.


Mutations located in the 109-amino acid fragment of NS5B are typically associated with resistance to interferon (IFN) and ribavirin (RIB) and to new antiviral drugs. The prevalence of these mutations was examined in 69 drug-naive individuals with hepatitis C virus (HCV) infections in Rio de Janeiro, Brazil. Mutations related to non-response to IFN/RIB were observed in all subtypes studied (1a, 1b, 2b, 3a and 4). The most common mutation was Q309R, present in all subtypes, except subtype 2b with frequency above 20%. D244N was detected only in subtype 3a and A333E was detected only in subtype 2b. We did not detect the S282T, S326G or T329I mutations in any of the samples analysed. Of note, the C316N mutation, previously related to a new non-nucleoside compound (HCV796 and AG-021541), was observed in only eight of 33 (24%) samples from subtype 1b. Site 316 was under positive selection in this HCV variant. Our data highlight the presence of previously described resistance mutations in HCV genotypes from drug-naive patients.


OBJECTIVES: To determine the prevalence of insulin resistance (IR) in non-diabetic patients with chronic hepatitis C, and to assess the association between IR, laboratory parameters and histological findings. SUBJECTS AND METHODS: Eighty-two patients had their serum analyzed for glucose, lipid profile, C-reactive protein (CRP), ferritin, alanine aminotransferase (ALT), aspartate aminotransferase (AST), HOMA-IR, viral load and HCV genotype. Patients with HOMA-IR levels > 2.5 were considered as carriers of insulin resistance. RESULTS: IR was observed in 27% of patients and was associated with age, waist circumference and body mass index. IR patients were more likely to have more advanced hepatic fibrosis and necroinflammatory activity, higher levels of aminotransferases and liver steatosis than patients without IR. CONCLUSIONS: Insulin resistance is often present in patients with chronic hepatitis C, and this parameter is associated with more advanced HCV-related hepatic fibrosis.


Chronic liver disease is a considerable burden on society, being one of the three main causes of death in certain regions of Africa and Asia. Liver transplant is the only treatment option for cirrhosis, which is the end stage of many chronic liver diseases. This article reviews the preventable causes of cirrhosis and the preventive strategies which could be implemented in order to avoid the catastrophic consequences of cirrhosis. With small variations around the world, 70 to 80% of the end stage liver diseases are caused by excessive alcohol consumption and by viral hepatitis, both of which are potentially preventable. Excessive alcohol consumption has important public health consequences because of its involvement not only with cirrhosis, but also with motor vehicle accidents, unemployment, domestic violence etc. Among the viral causes, Hepatitis Virus B and C have the greatest impact on public health. Effective vaccine is available for Hepatitis Virus B and must be put in use. While a vaccine for Hepatitis Virus C is awaited, effective preventive strategies should be undertaken to avoid the preventable cases of end stage liver disease.
4. Bibliography of the Speakers

MASSIMO GHIDINELLI (PAHO) Pubmed MEDLINE search name [Author]


FÁBIO MESQUITA (BRA) Pubmed MEDLINE search name [Author]


**Pierre Van Damme (VHPB-Belgium)** Pubmed MEDLINE search name [Author] + Hepatitis [all fields] 10 most recent


**Mark Kane (VHPB-USA)** Pubmed MEDLINE search name [Author]


Rui Tato Marinho (VHPB-PORTUGAL) Published MEDLINE search name [Author]


10 Marinho RT, Pinto RM, Santos ML, de Moura MC. Lymphocyte T helper-specific reactivity in sustained responders to interferon and ribavirin with negativation (seroreversion) of anti-hepatitis C virus. Liver Int 2004,24:413-418.

MIRA KOJOUHAROVA (VHPB-BULGARIA) Pubmed MEDLINE search name [Author]

Hepatitis


DANIEL SHOUVAL (VHPB-ISRAEL) - input speaker


5 Lai,-C-L; Shouval,-D; Lok,-A-S; Chang,-T-T; Cheinquer,-H; Goodman,-Z; DeHertogh,-D; Wilber,-R; Zink,-R-C; Cross,-A; Colombo,-R; Fernandes,-L. Entecavir versus lamivudine for patients with HBeAg-negative chronic hepatitis B. N-Engl-J-Med, 2006;354:1011-20


http://www.worldhepatitisalliance.org/en/


MARCELO BURATTINI (BRA) Pubmed MEDLINE search name [Author] + [Hepatitis]


NAHUM MÉNDEZ-SÁNCHEZ (MEX) input speaker


79


RAYMUNDO PARANÁ (GASTRO-HEPATOLOGY UNIT – UNIVERSITY HOSPITAL OF BAHIA, BRAZIL) Pubmed MEDLINE search name [Author] + Hepatitis [all fields] - 10 most recent


PAULO MASSAROLLO (BRA) Pubmed MEDLINE search name [Author] + Hepatitis [all fields] - 10 most recent

1. Pestana RC, Baracat EI, Massarollo PC, Pereira LA, Szutan LA. Consequences of the implementation of the Model for End-stage Liver Disease system for liver allocation in Brazil. Transplant Proc 2013,45:2111-2114.


GABRIELA VIDIELLA (ARGENTINA) input speaker

2. C, Stamboulian D. Accepted for presentation at the Argentine Society of Infectious Diseases Meeting. Mar del Plata-Buenos Aires, 2008

Fernando Contreras (Caribe)

CARLOS BENITES (PERU) PubMed MEDLINE search name [Author]


Jorge González (Argentina) [input speaker]


Angelo Alves de Mattos [input speaker]

1. Nader LA, Mattos AA, Bastos GAN. Burden of Liver Disease in Brazil. Liver Intern 2014 (Epub Ahead of Print)

Publications covering the content of the lecture: Burden of liver disease in Brazil


Publications covering the content of the lecture: Hepatitis E in Latin America

Andreas Stoeker (BRA) input speaker
3. P. Gingivalis HmuY-Soraya Castro Trindade, Teresa Olczak, Isaac Suzart Gomes-Filho, Lilia Ferreira de Moura-Costa, Vera Costa Vale, Milton Galdino-Neto, Heidiane Alves, Paulo Cirino Carvalho-Filho, Andreas Stocker, [.........], Maria Teresita Bendicho, Márcia T Xavier, Eneida de Moraes Marcellio Cerqueira, Roberto Meyer. Induced Production of Interleukin-6 and IL-6 Polymorphism in Chronic Periodontitis. Journal of Periodontology 07/2012; · 2.40 Impact Factor
Christian Drosten. **Bats host major mammalian paramyxoviruses.** Nature Communications 01/2012; 3:796. · 10.02 Impact Factor


**MARCELO SILVA (ARG) Pubmed MEDLINE search name [Author] + Hepatitis [all fields]- 10 most recent**


André Bonifácio (BRA)


4. Lima FA, Miyaji EN, Quintilio W, Raw I, Ho PL, Oliveira ML. Pneumococcal Surface Protein A does not affect the immune responses to a combined diphtheria tetanus and pertussis vaccine in mice. Vaccine. 2013 May 7;31(20):2465-70.


8. Lima FA, Miyaji EN, Quintilio W, Raw I, Ho PL, Oliveira ML. Pneumococcal Surface Protein A does not affect the immune responses to a combined diphtheria tetanus and pertussis vaccine in mice. Vaccine. 2013 May 7;31(20):2465-70.


THEMIS REBERVEL SILVEIRA (BRA) Pubmed MEDLINE search name [Author] + Hepatitis [all fields] - 10 most recent


JUAN MIGUEL SALCEDO (BRA) input speaker


2. DE OLIVEIRA DOS SANTOS, ALCIONE ; SOUZA, LUAN FELIPO ; BORZACOV, LOURDES ; VILLAGOBOS-SALCEDO, JUAN ; VIEIRA, DEUSILENE. Development of cost-effective real-time PCR test: to detect a wide range of HBV DNA concentrations in the western amazon region of Brazil. Virology journal JCR, v. 11, p. 16, 2014.


WORNEI BRAGA (BRA) Pubmed MEDLINE search name [Author] 10 most recent


Elisa Argia Basile Cattapan (BrA).

**LAURA ALVES DE SOUZA (BRA) input speaker**


**EDISON PARISE (PRESIDENT OF THE BRAZILIAN SOCIETY OF HEPATOLOGY) Pubmed MEDLINE search name [Author] 10 most recent**


7. Elias MC, Parise ER, de Carvalho L, Szejnfeld D, Netto JP. Effect of 6-month nutritional intervention on non-


Carlos Varaldo (Optimism Group of Hepatitis)

DAVID FITZSIMONS (RAPPORTEUR)


