



VIRAL HEPATITIS

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How to reach risk groups,' Ghent,
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This edition of *Viral Hepatitis* is based on material presented at the Viral Hepatitis Prevention Board meeting on **'Hepatitis B vaccination: How to reach risk groups,'** Ghent, Belgium, March 15-16, 2001.

EDITORIAL

Hepatitis B virus (HBV) is one of the world's most widespread infectious agents. Approximately 400 million persons worldwide are chronic carriers, with evidence of infection in over two billion people.¹ In 1992, the World Health Organization (WHO) recommended that all countries introduce universal hepatitis B vaccination into their immunisation schedules by December 1997. One hundred and twenty-nine countries have since complied with the recommendation.

The risk of contracting hepatitis B is associated with a number of factors relating to one's lifestyle, living conditions, occupation, and overall health and well-being.² HBV transmission occurs perinatally, i.e. from infected mother to infant, horizontally, sexually, or parenterally. On a worldwide basis, most infections are transmitted from an infected mother to her child, through child-to-child household contacts, and through re-use of unsterilised needles and syringes. In developing countries, the vast majority of children become infected with HBV.

In industrialised countries, HBV is transmitted primarily through parenteral or sexual exposure to HBsAg-positive blood or other body fluids (which contain the highest concentrations of the virus) from persons who are chronic HBV carriers or have acute hepatitis B. Those at highest risk of HBV infection include:

- Injecting drug users (IDUs);
- Persons who engage in unsafe sexual behaviour, such as heterosexuals with multiple sex partners, men who have sex with men (MSM), persons attending sexually transmitted infections clinics (STI), and sex workers;
- Household contacts, other social contacts, and sex partners of persons with acute or chronic HBV infection;
- Families adopting children originating from regions of intermediate or high hepatitis B endemicity;
- Immigrants or refugees from countries of intermediate or high hepatitis B endemicity;
- Babies born to mothers with persistent HBV infection or mothers who had acute hepatitis B during their pregnancy;
- Patients with specific medical conditions, such as haemophiliacs and those frequently receiving blood or blood products, haemodialysis patients and candidates for haemodialysis, transplant patients and candidates for transplant, and chronic non-hepatitis B liver disease patients;
- Workers whose occupation potentially involves exposure to blood and other body material, such as health care workers (HCWs) and public safety workers, their trainees and those in related professions, staff of residential day-care programmes and foster homes attended by children with known HBV infection or originating from regions of intermediate or high hepatitis B endemicity, and staff and clients of residential accommodation for the mentally handicapped;
- Inmates and staff of correctional facilities and prisons;
- Persons who plan to travel to areas of intermediate or high hepatitis B endemicity.

Hepatitis B vaccination programmes targeting risk groups appear to have met with little success in controlling HBV infection in the general population. Despite the long-standing existence of unambiguous recommendations for risk-group vaccination, hepatitis B vaccination coverage remains low in most risk groups in most industrialised countries. The low coverage may be attributed to a combination of factors relating to: (a) Lack of perceived risk of hepatitis B, not only among members of risk groups, but also among physicians and other health care professionals; (b) Absence of appropriate health care programmes targeting hepatitis B monitoring and vaccination for certain risk groups, particularly sex workers, injecting drug users, and prisoners.

The failure of this prevention strategy reflects the need for: (1) Further efforts in reaching high-risk groups and setting up high-risk group prevention programmes aimed not only at vaccinating those at high risk but also at changing their risk behaviour; (2) Increased

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awareness that considerable means will be required to achieve this; (3) Universal vaccination programmes targeting infants and/or adolescents.

The Viral Hepatitis Prevention Board (VHPB) recognises the importance of raising the awareness of health care providers, policy makers, and the general public, about hepatitis B as a risk to both the community in general and to specific groups considered at increased risk. This implies that clear and consistent messages regarding the benefits of hepatitis B vaccination should be transmitted to these target groups. In addition, low-risk sites, such as community health and family planning centres, primary care facilities, teen-ager clinics, and college or university health centres, should serve as information sources regarding prevention and control of viral hepatitis. VHPB also recognises that new strategies will have to be developed and implemented, including the integration of compliance services for high-risk groups.

The specific subject of control and prevention of hepatitis B in mobile populations has been treated before and the corresponding report has been published last year.³ The current report provides an overview of risk groups in various contexts - international, national, and regional - based on the presentations of participants at the VHPB meeting on 'Hepatitis B vaccination: How to reach risk groups' in Ghent, Belgium, March 15-16, 2001.

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'Hepatitis B vaccination: How to reach risk groups' Ghent, Belgium, March 15-16, 2001 - a VHPB Symposium Report -

Hepatitis B and injecting drug users - a UK perspective

Current guidelines for control of hepatitis B in the United Kingdom recommend selective vaccination for specific groups. Targeted persons include the following risk groups:¹

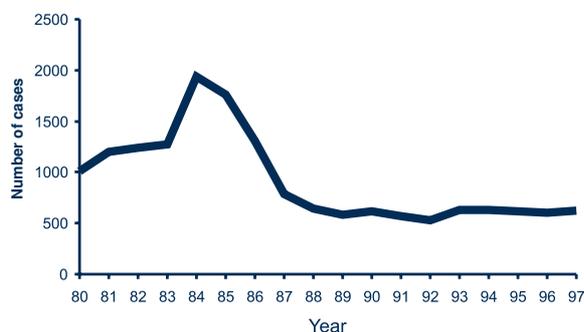
- Babies born to HBsAg-positive mothers;
- Injecting drug users;
- Prisoners;
- People with learning difficulties in residential accommodation;
- People exposed to blood as a result of their occupation or of medical treatment;
- Household or sexual contacts of infected persons;
- Persons potentially exposed to HBV infection through multiple sex partners;
- Health care workers.

The need to target injecting drug users in the UK became clear when the hepatitis B vaccine was first licensed in 1982.² In 1988, the Joint Committee of Vaccination and Immunisation listed 'parenteral drug abusers' as a category to be considered for immunisation, thus establishing injecting drug users as a target group for selective vaccination against hepatitis B virus infection.¹

Changing patterns of hepatitis B prevalence

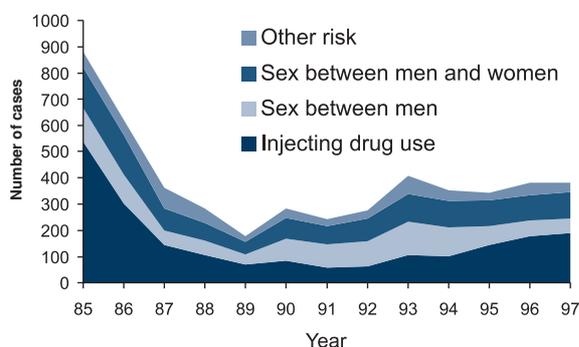
The prevalence of hepatitis B surface antigen in the UK is less than 1%. The current incidence of hepatitis B is 1.2 per 100,000, with infection occurring mainly in adults through injecting drug use or sexual intercourse among heterosexuals. During the early 1980s, the number of reports of acute hepatitis B nearly doubled on a yearly basis, reaching 1,939 cases in 1984, which was mainly attributable to infections in drug users.

Laboratory reports of acute hepatitis B: England and Wales, 1980-1997



Surveillance data from England and Wales indicate that acute hepatitis B infection dropped dramatically in the late 1980s, and remained stable until the early 1990s. Needle exchange programmes that were introduced in the UK in the mid-1980s and designed to prevent HIV transmission, may have contributed to a decrease in HBV transmission among IDUs.³ However, in the mid-1990s the number of HBV cases increased, and by 1995, one in five IDUs reported sharing equipment. The increase in cases since then may presage the start of another epidemic within the IDU community.⁴

Acute hepatitis B by major exposure categories: England and Wales, 1985-1997



No UK national programmes to monitor hepatitis B vaccination coverage

Currently, there are no national programmes in the UK to monitor HBV vaccination coverage. Data on hepatitis B vaccination coverage among IDUs have been collected through IDU self-reported information obtained via drug agencies in England taking part in the Unlinked Anonymous Prevalence Monitoring Programme (UAPMP).⁴

Survey data for 1995-1996 show 27% of IDUs (374/1,366) reporting vaccination against hepatitis B, with only 13% having completed a three-dose schedule. More recent data from the ongoing UAPMP survey show a slight increase in vaccination coverage in 1999, with 29% reporting they had been vaccinated against hepatitis B.⁵ Only 36% (20/55) of drug agencies in England offered hepatitis B vaccination on site. Data based on the results of a postal survey (69% response rate) carried out among 539 drug agencies in England and Wales, showed that only 27% of the agencies were providing routine HBV testing. Among the 56% who provided the hepatitis B vaccine, only 22% offered it routinely.⁶

Improving hepatitis B vaccination coverage among injecting drug users

Achieving higher vaccination coverage among IDUs will require more direct targeting of persons in this risk group via drug agencies

and caseworkers. In such settings, a sense of empowerment among IDUs should be encouraged by providing information on risks and prevention of HBV infection in such a way that the decision to vaccinate comes from the client rather than from the drug agency or caseworker.

Other strategies to achieve higher vaccination coverage would include improved access to public health and other services, with vaccination made more easily available to those at risk. Such services include:

- Services for drug users: (1) Community drug teams; (2) Drug dependency units; (3) Needle exchange/outreach programmes;
- Other settings: (1) Prisons and juvenile detention centres; (2) Probation services;
- Other health services: (1) Accident and emergency departments; (2) General practice; (3) Maternity units; (4) Sexual health, family planning, and genitourinary medicine (GUM) clinics.

Conclusions

Vaccination programmes targeting IDUs have had little success in the UK, suggesting that alternative/enhanced strategies need to be adopted.⁷

Accessibility and awareness are two of the key issues to improving hepatitis B vaccine coverage in injecting drug users. Hepatitis B vaccine should be made easily available to those injectors who need it. It is also vital that injecting drug users and drug and health care workers understand the benefits of hepatitis B vaccination.

Testing for serological markers of HBV infection should also be available to IDUs. An integrated approach to vaccine provision involving community outreach teams and other local and national services should be provided. Needle exchange harm reduction programmes are of high importance in this group since they act as effective control measures to prevent HBV and other blood-borne infections.

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Based on a presentation by Dr Koye Balogun, PHLS Communicable Disease Surveillance Centre, London, UK.

Health care workers and other workers at occupational risk of hepatitis B - a perspective from France

Hepatitis B in France - overview of carriers and vaccination coverage

Approximately 150,000 people in France (i.e. 0.2-0.3% of the total population) are chronic HBV carriers. While hepatitis B is not a notifiable disease, 20,000 new cases of acute hepatitis B were reported between 1991 and 1994. From 1984 to the end of 1999, 83 million hepatitis B vaccine units were sold in France. Extrapolating that figure, between 20 and 27 million people or 34-45% of the entire population received the hepatitis B vaccine in the given period. Hepatitis B vaccination for infants was initiated in 1995, and coverage is 30%

French legislation and hepatitis B

French legislation requires that all workers exposed to HBV infection be immunised when employed in the following settings:

- Private or public hospitals;
- Dental clinics;
- Laboratories;
- Blood transfusion centres;
- Facilities for mentally disabled;
- Day-care centres;
- Municipal services of hygiene and health;
- Training centres for paramedics;
- Occupational health services;
- School-based health services;
- Mortuaries;
- Hospital laundries.

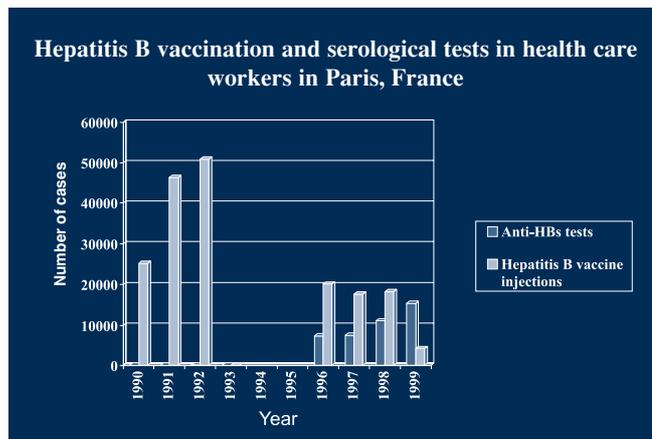
In other professions with risk of HBV exposure, employers in France are required to propose vaccination to the worker. What remains ambiguous in French employment legislation is whether risk assessment is the responsibility of the employer or of the occupational health physician.

Health care workers and level of risk

A survey was carried out between 1995 and 1999 among twenty-eight hospitals in Paris, with over 62,000 employees. Approximately 10,563 blood exposures were analysed. Seventy-five percent of the injuries were due to needlesticks, and 14% to mucous or skin contact. The following high-risk groups made up nearly 80% of the injuries, with cuts occurring more frequently among physicians (7%) than among nurses (4%):

- | | |
|--------------|-----|
| • Nurses | 47% |
| • Paramedics | 15% |
| • Physicians | 17% |

The table below shows the number of hepatitis B vaccine injections and serological tests performed on HCWs in forty-one Paris hospitals, with 88,000 employees. The increase in vaccination coverage between 1991 and 1992 reflects French legislation beginning in 1991 when vaccination of HCWs became mandatory. Data for 1993 to 1995 were unavailable. In 1998, the French government suspended mandatory booster immunisation, which was subsequently replaced by obligatory post-vaccination testing for anti-HBs.



Sources of exposure in an urban environment

Municipal workers make up a significant proportion of the national work force in France. These workers are employed in a wide range of sectors such as public safety, health, education, administration, and public utilities. However, many municipal workers are not afforded the same job safety and health protection benefits that are currently available to most workers in the private sector.

In France, most categories of municipal workers were excluded from the occupational health law of 1946. Similarly, in the United States, municipal workers were specifically excluded from the Occupational Safety and Health Act (OSHA) of 1970. In addition to health care workers at risk of specific exposure to biological agents, many city workers, such as police officers, fire fighters, and waste workers, are also at risk of exposure to blood-borne pathogens.

Needlestick injuries account for a high number of injuries and exposures to HBV and HIV infection. In 1994, a study was carried out in Paris on blood analyses of needles found on public roads. Fifty needles were randomly selected and analysed, of which 12% were positive for HIV antibodies. The blood was not analysed for HBV markers, but as HBV is more resistant than HIV, the risk may be considered at least identical.

Fire fighters at increased risk

Fire fighters are at increased risk for infectious diseases, including hepatitis B, due to emergency care required when helping victims at the scene of a fire or during other emergencies. Where rescue efforts are made in confined areas with limited lighting, there is increased risk of exposure to blood and other body fluids from needlestick and other injuries.

In France, hepatitis B vaccination is mandatory for professional fire fighters by virtue of the fact that they form part of the French army. The vaccination coverage is 100%, since recruits refusing the vaccine are simply not hired. Data for volunteer, non-professional fire fighters are not available.

A study on needlestick injuries was carried out in France in 1992 among sixty-one occupational health services, with over 100,000 municipal employees. Among the 276 needlestick injuries reported, the prevalence of HBV markers was 0.2%, with HBV infection occurring in five workers. In this study, fire fighters accounted for 20% of persons injured by needlesticks. More than 50% of those injured had been working on public roads.

Police officers

Little research has been published on the health and safety of police and correctional officers. These workers are at risk of exposure to blood-borne pathogens that can occur through needlesticks, blood and other body fluids of accident victims, and human bites. The risk of exposure to these agents is more likely to occur in areas where injecting drug use is prevalent. In France, vaccination has been strongly recommended for police officers since 1995. Although precise data on immunisation rates are not known, it is estimated that the coverage is close to 100%.

Other at-risk categories

Needlestick injuries are a subject of concern among waste workers who face risk of exposure through needles improperly discarded by injecting drug users, and persons with medical conditions requiring injections at home.

Sewage workers are potentially at risk of exposure to blood and other body fluids by the very nature of their work, although very few case reports of HBV infection in this group have been published.

Bar staff may be at risk through injuries sustained by cuts from unwashed, broken drinking glasses. They are also at risk of exposure to blood while doing general cleaning tasks or performing first aid, or through injuries from body contact as a bouncer.

Other workers (e.g., those in clothing factories, and butchers) may be considered at potential risk for HBV cross-infections in situations where sharp knives or hollow needles are shared.

Conclusions

It is clear that a wide range of workers are at risk of exposure to hepatitis B virus. Within the category of health care workers, vaccination coverage, in many instances, is not sufficiently high, and this is particularly true for physicians. Universal vaccination of the entire population would lead to lower risks of exposure of workers, and their susceptibility to HBV infection.

Based on a presentation by Dr Jean-François Gehanno, Office of Occupational Health Services of Paris Hospitals, Paris, France.

Health care workers and other workers at occupational risk of hepatitis B - a Belgian perspective

Vaccination against hepatitis B was initiated in Belgium in 1983, primarily through the 'Fonds voor Beroepsziekten'/Fund for Occupational Diseases (FOD). One year later, a vaccination programme for health care workers in Belgium was implemented, and for the following ten years pre-screening, although not mandatory, was carried out for a large number of employees. Only those not positive for HBV markers were vaccinated. Between 1984 and 1993, anti-HBs titres were routinely measured in most of the vaccinees between 1 and 2 months after the fourth injection (in a 0, 1, 2, 12 month schedule).

Between 1983 and 1992, 170,000 HCWs were vaccinated against hepatitis B, with 680,000 vaccine doses administered. Although less than 10% of HBV infections in a community occur in this category of worker,¹ Belgian health care policy has sought all possible measures to protect this risk group from infections due to their occupation.

The vaccination schedule in occupational settings in Belgium was 0, 1, 2, and 12 months in the year 2000, with a booster given after five years or if the anti-HBs titre is lower than 100 mIU/ml.

Survey among Flemish health care workers

A survey was carried out in Belgium between 1996 and 1997 among 5,064 employees in twenty-one general hospitals and one university hospital, with the aim of testing for anti-HBs.² The hospitals were located in Flanders and Brussels, and randomly selected from 109 hospitals that are affiliated with IDEWE ('Interdisciplinaire Dienst voor het Welzijn'/Occupational Health Services). The survey sample reflects responses from 22/109 (20%) of the hospitals affiliated with IDEWE, and 17,288/33,360 (52%) of all employees in the 109 hospitals. Among the selected hospitals, 29% of the employees were tested, or 15% of all employees in all affiliated hospitals. The overall vaccine uptake was 80% (4,049/5,064).

A self-administered, standard questionnaire was used to obtain data from participants regarding age, sex, specific tasks and duties, and information regarding their own status regarding hepatitis, including former vaccination against hepatitis B.

The survey sample consisted of 983 (19.4%) men, and 4,081 (80.6%) women. The mean age was 37.2 years.

Vaccination coverage

Four categories of hospital departments were identified as being at high risk:

- Those in which actual medical activities are carried out, putting employees at highest risk of contact with infected patients and infected blood;
- Out-patient clinics;
- Medico-technical departments;
- Psychiatric departments.

Vaccination coverage among employees within these four high-risk departments was 91.15%, compared with less than 58.48% in other departments at lower risk. From the total sample, 4,049 persons (79.96%) reported having received at least one hepatitis B vaccine dose.

Hepatitis B vaccination coverage, seroconversion, and seroprotection in health care workers (n = 5,068) in Flanders and Brussels, Belgium, according to age - IDEWE survey

Age group (yrs)	Percentage vaccinated	Percentage seroconverted	Percentage seroprotected among seroconverters
< 25	77.5	73.0	97.8
25-34	88.7	86.6	98.1
35-44	84.0	80.6	97.8
45-54	81.6	79.0	95.9
> 55	86.2	80.0	97.0
Total	84.9	82.0	97.6

Among the high-risk professions, 94.8% of nurses were vaccinated, and 97.3% of laboratory workers. For all other professions combined, vaccination coverage was approximately 67%, with the lowest coverage among those in low-risk positions - 39% for administrators, and 44% for workers in catering services.

Hepatitis B vaccination coverage in traditional and allied health care workers (n = 5,041) in Flanders and Brussels, Belgium, according to job or task - IDEWE survey

Job or task	Percentage vaccinated
Administration	39.1
Nursing staff	94.8
Laboratory	97.3
Physiotherapy	85.4
Maintenance-Technical	87.7
Catering	44.4
Not specified	77.4
Total	84.9

IDEWE data on other workers

Other data provided by IDEWE show that for workers in institutions for the handicapped, vaccination coverage (at least 3 doses) is 61% for educators, and 52% for cleaning staff. Hepatitis B vaccination coverage (at least 3 doses) for physicians, firemen, and policemen is at very low levels - less than 30%.

Interim health care workers

Interim HCWs are becoming an increasingly important part of the work force in Europe, particularly within the nursing profession. However, they are less likely to be screened and monitored than

IDEWE routine data on hepatitis B vaccination coverage among physicians, firemen, and policemen

Profession	Number	Vaccination coverage (%)
Physicians	1,751	27.9
Firemen	1,607	20.1
Policemen	746	21.7

permanent HCWs and, therefore, need to be targeted in future hepatitis B vaccination programmes.

Conclusions

The IDEWE survey sample may be considered representative of the health care institutions affiliated with the IDEWE Occupational Health Services in Belgium, representing over 30% of the Flemish health care institutions. High hepatitis B vaccination coverage, and seroconversion and seroprotection rates are achieved, at least for those employees considered at high risk, and for the specific

hospital departments with higher risk for blood-borne infections. Further efforts are still needed to encourage unprotected health care workers to participate in vaccination programmes.

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Based on a presentation by Dr Antoon De Schryver, IDEWE Occupational Health Services, Leuven, and Ghent University, Ghent, Belgium.

Hepatitis B vaccination for sex workers in Europe

Sex workers are generally at occupational risk of hepatitis B infection. In assessing the prevalence of markers for HBV infection, two groups of sex workers may be considered - those who begin sex work with immunity against HBV infection, and those who begin sex work without immunity.

Immune sex workers

Among immune sex workers, immunity will have been acquired either naturally through infection or through vaccination. The prevalence of specific markers for HBV infection among sex workers reflects the degree of prevalence in the geographical area from which they come.¹ In areas of high endemicity, the prevalence of HBsAg carriers may range from 8% to 20%. These sex workers may pose a risk for clients when working in areas of low endemicity. Injecting drug users also pose a risk for clients, having acquired infection through blood contact.

In a study² carried out in Ghent, Belgium, between 1992 and 2000, 52 out of 1,015 sex workers who were in first-time contact with a sex worker outreach programme, reported having received hepatitis B vaccination in a general health care setting. Most of those who had been previously vaccinated were women from France who had benefited from hepatitis B vaccines that have been freely available in France since 1995. Other sex workers reported having been vaccinated in Belgium as students in nursing schools or similar settings. Only eleven sex workers (1.1%) had been vaccinated because of their sex work occupation. In total, 83.3% tested negative for all HBV markers.

At the beginning of their careers, female sex workers from low-endemic countries will often show similar vaccination characteristics as other women of the same age in the general population. In countries where universal vaccination is in place, most young sex workers will be protected, depending on the starting date of the vaccination programme and on whether vaccination is targeted to infants or adolescents. However, older sex workers and migrant sex workers may be at risk if the vaccination programme was not in place at the time they began sex work. In countries where universal vaccination has not been implemented, most sex workers will not be protected against HBV infection.

Non-immune sex workers

Sex workers without HBV markers are at constant risk of becoming infected by HBsAg-positive clients. A study³ carried out in Atlanta, Georgia, showed HBV markers in 58% of clients of male sex workers, and 24.6% in clients of female sex workers. Although use of condoms is considered a protective measure in preventing sexually transmitted infection, condom failure is estimated to be between 0.8%⁴ and 5.7%⁵ in commercial sex contacts.

In Singapore, an area of high endemicity, a significant correlation was found between the duration of sex work as an occupation and the prevalence of HBV markers, with a doubling of HBV-specific antibodies after the first year of prostitution.⁶

In countries of low endemicity it is difficult to prove whether sex work as such is an attributable risk; one would have to prove that the incidence of infection among sex workers is higher than

in a control group with similar characteristics. However, given the number of clients who pay for sex and the relatively high rates of condom failure, protection of non-immune sex workers through hepatitis B vaccination is defensible.

Constraints for hepatitis B vaccination

Vaccination coverage for sex workers tends to be very low in many countries. In the Ghent sex worker outreach programme, more than 82% of first-time contacts in 2000 were not protected against HBV infection.²

Hepatitis B vaccination programme in sex workers in Ghent, Belgium⁷

Category	Number of sex workers						
	1992-1995	1996	1997	1998	1999	2000	Total
First-time contacts	348 (116/yr)	134	117	131	117	168	1,015
Naturally acquired infection	48 (13%)	19 (14%)	16 (14%)	17 (13%)	14 (12%)	18 (11%)	132 (13%)
Vaccinated before start of sex work	3 (0.9%)	6 (4.5%)	6 (5.1%)	6 (4.6%)	19 (16.2%)	12 (7.1%)	52 (5.1%)
Vaccinated as sex worker/ vaccinated before start of sex work	1/3	1/6	3/6	2/6	3/19	1/12	11/52 (1.1%)
To be vaccinated	300 (100/yr) (87%)	115 (86%)	101 (86%)	108 (82.4%)	84 (71.8%)	138 (82.1%)	846 (83.3%)

Constraints for vaccination in existing European health care systems

Persons at risk of hepatitis B infection are often not identified as candidates for vaccination, either because they are not in contact with a health care facility, or because they are not identified as being at risk during routine health care examinations. The European Network for HIV/STD Prevention in Prostitution⁷ has attributed the low coverage of hepatitis B vaccination among sex workers to the fact that:

- Sex workers may not always qualify for health care services, particularly where sex work is not recognised as an official occupation. In such cases, sex workers cannot be considered eligible for benefits within a country's social security system. Similarly, those without residence permits are excluded from national health care systems.
- Health care systems are often not appropriate settings for sex workers, particularly in European countries where health care workers are often reported to have negative attitudes towards sex workers, and to appear insensitive to their health care needs. As a consequence, sex workers often do not reveal their true occupation in health care settings, or may avoid health services altogether.

Other factors contributing to low vaccination coverage are: (a) The cost of the vaccine (in Belgium, approximately 100 euro for a

complete vaccination series); (b) Unsuitable opening hours of health care facilities; (c) Emphasis, in most health care settings, on cure rather than prevention; (d) High mobility of sex workers, especially migrants and illegal sex workers; (e) Doctors' opinions about the need for hepatitis B vaccination in general, and for sex workers in particular.

Outreach programmes

As non-identification and difficult access appear to be the main constraints against hepatitis B vaccination among sex workers, bringing services to this risk group through outreach programmes is a logical approach. In such a setting, sex workers do not need to explain their professional activity, and the health care worker has a first-hand opportunity to see the reality of conditions involved in sex work.

Practical constraints, such as inconvenient opening hours at traditional health care centres, and travel distance from place of work to a medical centre, are irrelevant in outreach settings. As HBV infection does not appear to be high on the list of problems faced by sex workers, it cannot be expected that this risk group will spend much time or effort in seeking opportunities for vaccination. Therefore, barriers for vaccination of sex workers should be kept as low as possible.

In the Ghent outreach programme, vaccination has been carried out among sex workers on a regular basis since 1992. A team consisting of a medical doctor and a social nurse visit the workplace, introduce the vaccination programme to the sex worker, and provide other general health information relating to sex work. The vaccine is administered free of charge and anonymity is guaranteed through use of a unique code number linked with the sex worker's date of birth, artist name, and general workplace location.

Project workers take the initiative for follow-up visits, and the sex worker is asked to contact the organisation when changing workplace. In addition to screening for HBV infection, free

screening is also offered for sexually transmitted infections such as *Chlamydia trachomatis* infection, gonorrhoea, syphilis, HIV infection, and HPV infection. Psychosocial and legal problems related to sex work may also be discussed.

Conclusions

The Ghent project provides practical examples of how sex workers can protect themselves against occupational risks. The project also demonstrates how a comprehensive approach to the health care needs of sex workers can succeed, with hepatitis B vaccination playing a central role.

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Based on a presentation by Dr Rudolf Mak, Department of Public Health, Ghent University, Ghent, Belgium.

Hepatitis B vaccination programmes for men having sex with men

Men having sex with men, i.e. sexually active homosexual and bisexual men, are at increased risk of acquiring infection with the hepatitis B virus. Some European countries have approached the problem of reaching this risk group for vaccination through gay support groups, sexually transmitted disease (STD) clinics, genitourinary medicine clinics, as well as other traditional and non-traditional high or medium-risk sites. In Sweden, hepatitis B vaccination is free of charge for MSM, although there is no ongoing active promotion to support vaccination efforts. In Denmark, although the price of the vaccine has been reduced for MSM, there is no active promotion to encourage vaccination. In the UK, vaccination is available free of charge at any GUM clinic.

Hepatitis B vaccination pilot programme for high-risk groups in The Netherlands

A pilot project was undertaken in The Netherlands between October 1998 and October 2000 offering hepatitis B vaccination through Municipal Health Services free of charge to 'classical' risk groups, including IDUs, MSM, sex workers and their clients, and heterosexuals with risk behaviour (visitors to STD clinics). The aim of the pilot project was to assess the feasibility of reaching high-risk groups and their degree of vaccine acceptance. The programme was also designed to help devise strategies and to

develop methods that would result in improved vaccination coverage among these risk groups. In four intervention areas outreach activities were undertaken, while in three control areas the vaccine was simply made available.

In Amsterdam, one of the intervention areas, a Municipal Health Services co-ordinator was appointed to register the data. Vaccination was administered through general practitioners, or at STD clinics, methadone centres, and other locations. In the two intervention areas in South Limburg and the one in the central region of The Netherlands, a co-ordinator was appointed to register the data and to administer the vaccine. A head-hunting approach was used by word-of-mouth contact to encourage participation in the pilot project. Active promotion of the pilot project involved distribution of flyers, advertising, and role modeling at gay-scene venues where on-the-spot vaccination took place in bars, saunas, and parking places. The pilot programme was also promoted at STD clinics.

In the Amsterdam STD clinics, a crash course was offered to all nurses involved in the project. Hepatitis B vaccination was offered to clients who could communicate in Dutch or English, had a postal address, and would remain available for seven months in order to complete the entire vaccination schedule. Information was made

available to clients via nurses and through distribution of flyers. All participants were given hepatitis B vaccination during their first visit and blood samples were taken for HBV marker analysis. Second and third doses were subsequently scheduled for those testing negative. They were provided with a specific date and time for the next dose, and reminders were sent as a follow-up in advance of an appointment. Those who tested positive were referred to the regular health care for further follow-up, counselling, and advice.

The results of the pilot project showed that the most successful initiatives were those involving personal contact with MSM, IDUs, and sex workers in the STD clinics, at general practitioners, as well as in non-clinical, non-traditional settings:

- MSM in parking places;
- IDUs through outreach programmes;
- Sex workers in bars and clubs.

The first vaccine dose was given on-the-spot in all three above-mentioned locations. Contact advertisements were also

shown to have worked successfully among MSM in South Limburg, but met with no success in Amsterdam. Vaccination at prisons was successful, but compliance was a problem.

Conclusions

Conclusions drawn by the Medical Health Services in The Netherlands point to the success of the pilot project, and the feasibility of reaching high-risk groups through a combination of traditional and non-traditional channels. Successful strategies also depend on involvement at local levels where such expertise can contribute a body of knowledge to vaccination programmes that depend on logistics, acceptance, and compliance. Preparations are under way for a nationwide programme, offering hepatitis B vaccination to these high-risk groups through the Municipal Health Services. The programme is scheduled to start in early 2002.

Based on a presentation by Dr Jim van Steenberg, LCI / Coordination Communicable Disease Control, The Hague, The Netherlands.

Integration of hepatitis B vaccination services for high-risk adolescents and adults at STD clinics and other sites in California

Persons attending clinics for the diagnosis and treatment of sexually transmitted diseases are members of groups at high risk of acquiring hepatitis B through sexual or parenteral transmission. Such groups include IDUs, MSM, and persons with multiple sex partners practicing unsafe sex or having a history of STD. Vaccination is offered free of charge to all STD clients in many countries throughout the world, including the United Kingdom, Ireland, the USA, Australia, Canada, and The Netherlands.

In the United States, the Centers for Disease Control and Prevention (CDC) recommends hepatitis B vaccination to all clients in STD clinics. The US Public Health Service's Healthy People has set a 2010 target date to increase to 90% the proportion of STD clinics offering vaccination to all clients. Currently, this proportion is approximately 5%.

A comprehensive strategy for hepatitis B elimination in the United States focuses on:

- Prevention of perinatal HBV transmission through screening of pregnant women for HBsAg and treatment of their neonates;
- Identification of household contacts of infected women who should be vaccinated;
- Routine vaccination of children born to HBsAg-negative mothers;
- Vaccination of at-risk older children and adolescents;
- Vaccination of high-risk adults: persons at occupational risk, IDUs, MSM, and high-risk heterosexuals;
- Screening of blood/organ/tissue donors.

In the USA, persons with acute hepatitis B are generally male (60%) and between fifteen and forty-nine years of age (85%). Caucasians account for 55% of cases followed by African-Americans (33%), Hispanics (10%), and Asians/Pacific Islanders (5%). Forty percent of persons with acute hepatitis B in the USA have had multiple sex partners (two or more during the six-month period before onset of illness), are MSM (15%), or are IDU (15%). Estimated hepatitis B vaccination coverage among adults in the USA is between 3% and 10%.

San Diego Project

Between February 1998 and July 2000, a CDC-funded Viral Hepatitis Prevention Project was carried out in San Diego. The aim of the project was to evaluate hepatitis B vaccination for high-risk adolescents and adults, with data analysed by risk group and number of high-risk and lower-risk sites. The high-risk sites included an STD clinic, drug rehabilitation programmes, methadone treatment sites, social service centres for MSM clients, mobile clinics for homeless teen-agers, job corps programmes for disadvantaged youth, juvenile detention and adult county detention centres, and HIV testing sites. Lower-risk sites included community health centres, family planning and primary care services, teen-ager clinics, and college/university health centres.

The San Diego STD clinic offers services five days a week and sees approximately 17,000 clients a year, of whom 9,000 are 'new' (i.e. with no prior visit in the past 30 days). The clinic offers STD/hepatitis risk assessment, and hepatitis B vaccination to all who are considered eligible by not having been previously vaccinated or infected (i.e. approximately 85% of clients are eligible). During the thirty-month survey period, 74% of 13,009 eligible clients received a first hepatitis B vaccine dose, 55% received a second dose, and 31% received a third dose. Details are given in the following table.

Hepatitis B vaccine uptake in the San Diego STD clinic, February 1998 - July 2000

Client category	Number of eligible clients	Uptake dose 1	Uptake dose 2	Uptake dose 3
MSM	1,045	73%	67%	47%
IDU	652	77%	57%	31%
Other	11,312	74%	54%	30%
Total	13,009	74%	55%	31%

A one-stop comprehensive service to attain higher uptake levels

Studies carried out in the United States and the United Kingdom have shown that approximately one-third of persons diagnosed with acute hepatitis B have been treated for an STD at some time

prior to acquiring HBV infection, suggesting a missed opportunity to vaccinate and prevent hepatitis B. Data have shown that hepatitis B vaccination in STD clinics is feasible with a coverage of 60 to 70% for first-dose acceptance, 50% for the second dose, and 25-30% for completion of the series.

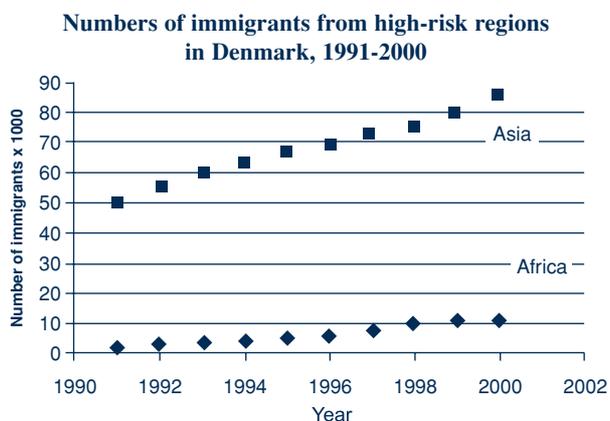
It has also become clear that high-risk persons in STD clinics, in correctional facilities, and in HIV counselling, testing, and drug rehabilitation programmes, are in need of multiple hepatitis services, as well as HIV testing and STD screening. Multiple hepatitis services providing prevention counselling, selective screening for HBV or HCV markers, hepatitis B vaccination, and

hepatitis A vaccination based on risk, can be integrated with HIV and STD services to provide a one-stop comprehensive service for high-risk persons. Studies are underway to evaluate this approach. Preliminary findings suggest that such integration is feasible, and that most clients accept all the indicated services being offered. The findings also suggest that expanding the concept to include additional sites should be further evaluated.

Based on a presentation by Dr Robert A. Gunn, STD Control Officer, STD and Hepatitis Prevention Program, San Diego County, California, USA.

Prevention and surveillance of hepatitis B in Denmark

Within the fifty-one member states of the WHO European Region, HBsAg carrier rates vary between 0.05% and approximately 20%, with Scandinavian countries having the lowest rates.¹ Due to an increasing number of immigrants, primarily from Asia and Africa, both of which are areas of high endemicity, Scandinavia is nevertheless facing problems of new modes of transmission, presumably due to an increasing incidence of chronic hepatitis B. The evolution of the numbers of immigrants from high-risk regions in Denmark is shown in the figure below.



Hepatitis B in Denmark

The incidence of acute hepatitis B in Denmark has significantly decreased in terms of numbers of notified cases, ranging from over 200 in the mid-1980s to 64 in 2000.² Although there is no definitive explanation for this decline, the total number of notified drug users with HBV infection has declined, as well as the number of cases of sexually transmitted HBV infection. There have been no major outbreaks detected for the last few years.³ Initiatives for a more active screening procedure for injecting drug users and reimbursement in methadone centres and the Prison Service, together with safer sexual behaviour among heterosexuals may be contributing factors to this decline.

Household and social contacts

The risk of HBV transmission from household and social contacts is nevertheless relatively high and new trends in transmission have been observed. During the period 1995-2000, nine cases of transmission to day-care employees took place, possibly due to horizontal transmission from children with chronic hepatitis B.⁴ Four parents were infected due to transmission from adopted children and also a few children in day-care institutions and schools have had acute infection due to horizontal transmission from other children.

In 2000, sixteen cases of chronic hepatitis B in children were notified in Denmark, all of whom were children from areas of high endemicity, and who had been infected in their own country, according to the Department of Epidemiology, Statens Serum Institut, Denmark.

New initiatives to help improve surveillance and prevention

Several new initiatives have been undertaken in Denmark since 1999 to help improve surveillance and prevention of hepatitis B. For day-care institutions, a new recommendation was introduced in 1999 for vaccination of both staff and children when a carrier under the age of five has been identified. In 2000, a new vaccination system was put in place to reimburse recommended vaccination taking place in day-care institutions.

Other initiatives include:

- A revised system requiring notification of both acute and chronic hepatitis B;
- Providing reliable information regarding hepatitis B to parents adopting children from high-risk areas, such as:
 - The importance of testing children identified as high risk;
 - Re-testing of the adopted child upon arrival in Denmark.
- New recommendations for vaccination in day-care institutions if the child has chronic hepatitis B.

Medical Technical Assessment Reports

A Medical Technical Assessment Report has been prepared and will hopefully be implemented in Denmark in 2001, in order to assess the need for universal childhood vaccination and/or the need for a change in the national guidelines. The report will:

- Evaluate the prevalence of hepatitis B in children, adolescents, and pregnant women;
- Re-evaluate national guidelines for high-risk groups, including children;

Methods for obtaining data on hepatitis B will consist of data based on:

- Notifications;
- Sero-epidemiology;
- Register data (National Hospital Register and Death Register);
- Literature, including guidelines from other countries.

An evaluation of vaccine information in terms of efficacy, safety, scheduling, parents' acceptance of vaccination, and cost-effectiveness will be part of the report as well.

Participants in the process include:

- Statens Serum Institute, providing surveillance data and vaccine expertise;
- Clinicians specialised in infectious diseases and paediatrics;
- General practitioners;
- Medical Health Officer;
- An economist.

Conclusions

Vaccination policies targeting risk groups must remain in place,

together with continued surveillance of hepatitis B with regard to modes of transmission, which might change over time, therefore, requiring a need for a change in the national guidelines.

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Based on a presentation by Dr Anne-Marie Plesner, Danish National Board of Health, Copenhagen, Denmark. Present address: Medical Department, Statens Serum Institut, Artillerivej 5, 2300 Copenhagen S, Denmark.

Pregnant women and at-risk neonates - United Kingdom

The most frequent and efficient route of hepatitis B virus transmission worldwide is perinatal, with infection of a child occurring during delivery through direct contact with the infected mother's blood, or vertical, through placental leakage *in utero*. An infant born to an infected mother has a 90% chance of remaining infected and eventually developing long-term complications such as chronic liver disease and hepatoma, both of which are associated with high morbidity and mortality.¹ These carrier children represent, in addition, a reservoir of infection to others with whom they are in contact.

Universal antenatal screening for hepatitis B in the UK

The World Health Organization has recommended that all countries integrate hepatitis B vaccination in their national immunisation programmes by 1997. In the UK, this recommendation has not been implemented, based on the view that few additional childhood infections would be prevented by universal infant vaccination, given the country's low endemicity.² It is also argued that vaccinating infants would take many years to impact upon the incidence of hepatitis B in adulthood, unless a policy of universal adolescent immunisation were also adopted.³

Conclusions drawn from a number of studies carried out on various antenatal screening policies show that:

- Selective policies fail to identify all HBV-infected women;
- Prevalence varies not only by country but also by area within the same country;
- Differences among ethnic groups and other demographic characteristics contribute to differences in the proportion of women with high infectivity in the same country.

In light of the conclusions of these studies, the UK Department of Health set a target date of April 2000 for full implementation of universal antenatal testing throughout the UK - a policy that reflects the view that such testing is the only option for identification of all babies at risk of infection.

Standards for antenatal screening for hepatitis B

The new organisational standards for antenatal screening for HBV infection require the following:

- The appointment of an individual to take responsibility for co-ordinating and monitoring the screening programme in each Health Authority;
- Training for all midwives and others involved in patient care in order to improve communication with mothers and their children;
- Drawing up communication procedures among the various health care sectors;
- Computerisation of vaccination records to allow audits of vaccination coverage, with data on prevalence provided by local hospitals.

In order to help sensitise health care workers to the needs of their patients, further training programmes will be implemented, with the aim of helping patients to develop a sense of empowerment in taking decisions regarding their own health care and that of their children. Local health care centres must also ensure that women have test results fully explained to them and, wherever possible, to provide access to verbal and written information in their own language. The National Health Service (NHS) publishes information leaflets on hepatitis B in Urdu, Punjabi, Gujarati, Vietnamese, among others, to serve non-English speaking communities.

Other standards for the UK's antenatal hepatitis B screening programme require that:

- All infants at risk will receive a first dose of vaccine within 48 hours of birth;
- Infants born to mothers who are most infectious will receive hepatitis B immunoglobulin (HBIG) within 48 hours;
- All infants will receive a full course of the vaccine at 0, 1, 2, and 12 months, with a serum sample taken from the child at 12 months of age to identify babies who are carriers;
- Mothers be encouraged to breast-feed.

Lack of national data on hepatitis B vaccination

While some local hospitals offer screening services, they do not contribute to national data collection. The only data that are centrally gathered by the Public Health Laboratory Service are collected from the Transfusion Centres in Birmingham, Oxford, Leeds, Cambridge, and Sheffield. While audits have shown that hepatitis B vaccination of infants has taken place, that information is not centrally recorded. Although a Child Health Computer System records all routine childhood immunisation, hepatitis B vaccination is not a 'routine immunisation' in the UK.

Vaccination card contributes to higher vaccination uptake

Between 1990 and 1993, an audit was carried out among six Birmingham health units. In mid-1993, it was decided to introduce a vaccination card - a take-home piece for mothers as a reminder of their child's vaccination schedule. A re-audit was carried out between June 1993 and July 1995 at one local hospital, showing an improvement in uptake of all doses. The uptake rate was particularly high for babies at twelve-months of age who were also receiving a blood test at that time. A 30-68% improvement rate was noted for babies in this age group. In 2000, the audit of Birmingham immunisation showed that 100% of at-risk babies had received their first, second, and third doses of hepatitis B vaccine.

Monitoring of infant vaccination programme

Monitoring of the hepatitis B infant vaccination programme will require good communication with paediatricians in every maternity unit. The goal of improved record-keeping systems requires that the Child Health Computer Service be kept informed of all vaccinations. Information should also be provided to parents, allowing them access to essential data for each child through the hepatitis B vaccination card and the 'Personal Child Health Record'. This information would include not only child, family, and local details, but would also provide parents with general health advice on feeding and immunisation, and other information regarding the child's development and routine health examinations.

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Based on a presentation by Dr Elizabeth Boxall, Public Health Laboratory and Blood Transfusion Service, Birmingham, United Kingdom.

Hepatitis B in haemodialysis patients

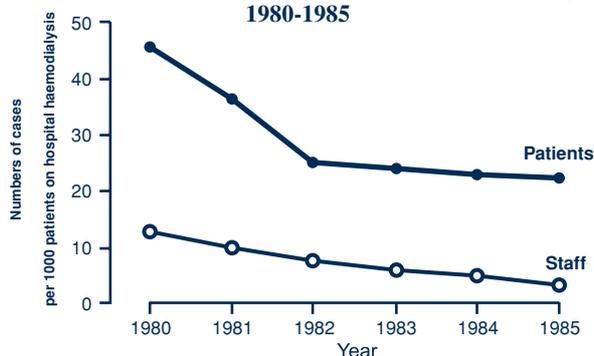
Historical data

Since haemodialysis was first performed in the 1960s, the risk of HBV transmission to haemodialysis patients and staff has been apparent. There is a high risk for blood-borne viral infection due to the patients' needs of blood transfusions for renal anaemia. In addition, the dialysis procedure itself is a risk factor for infection. Therefore, prevention of blood-borne infection in haemodialysis units is highly important.

HBV infection has decreased in this risk group during the last ten years, mainly due to improved and more systematic screening procedures, isolation of HBV-positive patients, intensive immunisation of haemodialysis patients and staff, and decreased re-use of dialysers. In fact, re-use of dialysers is not a risk to patients if the same dialyser is used for the same patient; however, it does present a risk to staff. In addition to these factors, 80-90% of patients are now being treated with erythropoietin (EPO), which has led to a decreased risk via blood transmission.

In Europe, the number of new cases of HBV infection in both dialysis patients and staff decreased significantly in the period 1980-1985, as shown in the following graph.

Hepatitis B in haemodialysis patients and staff in Europe, 1980-1985



Similarly, in the United States, the incidence of HBV infection dropped dramatically in the last several decades. Data corresponding to the period 1974-1996 are shown in the following table.

Hepatitis B in haemodialysis patients and staff in the USA, 1974-1996

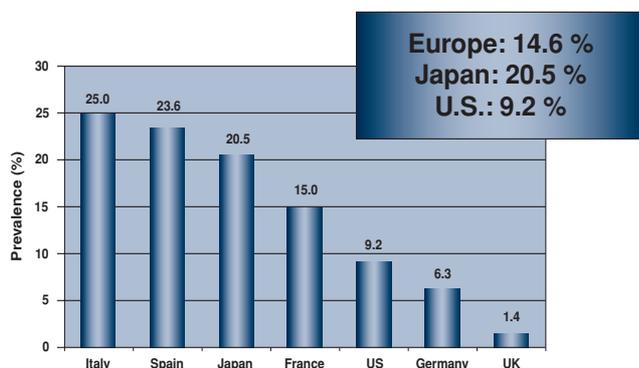
Year	Hepatitis B incidence in patients (%)	Hepatitis B incidence in staff (%)
1974	6.2	5.2
1980	1.0	0.8
1996	0.08	0.05

Dialysis Outcomes and Practice Patterns Study (DOPPS)

DOPPS is a large, prospective, observational study² of representative samples of haemodialysis patients in France, Germany, Italy, Japan, Spain, the United Kingdom, and the United States. DOPPS collects data regarding the patients' demographic characteristics, medical histories, laboratory values, prescriptions, dialysis unit practices, and outcomes. The study seeks to clarify which dialysis practices contribute to reduced mortality and hospitalisation rates, and which contribute to enhanced health-related quality of life.

Over 18,000 patients have been enrolled to date. A cross-sectional survey on HBV prevalence was undertaken among 7,283 haemodialysis patients in 309 dialysis centres. The results showed wide variations in prevalence among the various countries and regions surveyed, as shown in the figure on the next page.

Hepatitis B prevalence in haemodialysis patients from different countries



The considerable variation in prevalence of hepatitis B among haemodialysis patients in countries and facilities depends on each centre's policies for screening, vaccination, and the use of standard protocols for infected patients. Other key factors include patient characteristics, such as age, sex, and erythrocyte sedimentation rate.

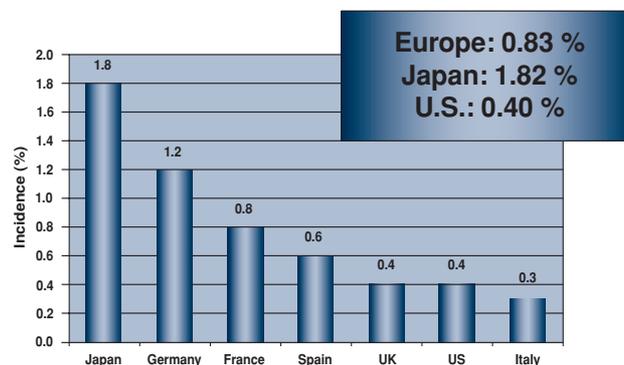
Hepatitis B incidence among haemodialysis patients

Although seroconversion rates and anti-HBs titres in haemodialysis patients are lower than those in healthy persons, patients who do respond to vaccination will be protected from infection, and the need for frequent serological testing will be reduced. Data from the DOPPS study² show an incidence of less than 2% for Europe, Japan, and the United States, as shown in the table in the next column.

Preliminary European data - 2001

A questionnaire concerning HBV infection formed the basis for a preliminary cross-sectional survey carried out among haemodialysis patients in sixteen haemodialysis centres in nine countries. The results showed that screening for HBV markers occurs mostly at the start of dialysis treatment, with a frequency of testing between 3 and 6 months. Three quarters of the patients had been isolated. Ten out

Hepatitis B incidence in haemodialysis patients after hepatitis B vaccination



of the sixteen centres are using hepatitis B vaccine boosters for the haemodialysis patients, and twelve of the centres are using boosters for their staff.

Conclusions

While dramatic reductions in hepatitis B prevalence among haemodialysis patients have occurred during the last years, several factors, such as the current HBV infection prevalence (14%) and incidence (1%) in Europe, highlight the need for continued efforts to reduce HBV infection in many dialysis centres, which still remains a considerable risk.

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Based on a presentation by Dr Monique Elseviers, University Hospital Antwerp, Edegem, Belgium.

Patients receiving blood products: risk of hepatitis B

In the United States, and very likely in Western Europe, the estimated risk for transmitting HBV through a blood transfusion is very low - approximately 2/1,000,000 (or 1/500,000 - 1/640,000). These figures are based on the results of a survey carried out among 586,507 volunteers donating blood at five USA blood centres between 1991 and 1993, with a total of 2,318,356 allogeneic blood donations.¹ The ultimate goal is to further reduce the risk and even achieve zero risk for post-transfusion hepatitis (PTH).

Major groups at risk of HBV infection from blood products include those with the following medical conditions:

- Patients needing multiple transfusions: anaemic patients (e.g., those with thalassaemia or sickle cell anaemia) and cancer patients pending chemotherapy;
- Chronic liver disease;
- Transplant patients (bone marrow, kidney, heart, liver);
- Idiopathic or thrombotic thrombocytopenic purpura (TTP);
- Autoimmune disease;

- Haemodialysis patients/candidates;
- Patients frequently receiving anti-coagulation medication;
- Patients awaiting elective surgery in countries where HBV infection is endemic.

A common theme among defined risk groups such as patients with chronic liver disease and patients awaiting liver transplant, is the low response rate to hepatitis B vaccination.

The question of whether hepatitis B vaccination is indicated for patients awaiting orthotopic liver transplantation (OLT) and for patients after OLT, was examined in an American study,² with the following results:

- Only 9/57 (16%) OLT candidate patients seroconverted to anti-HBs within three months after the last 20 mg dose of hepatitis B vaccine;
- Patients with cholestatic liver disease responded significantly better to the vaccine (6/14 or 43%; $p < 0.004$);

- Only 3/45 (6.6%) of the OLT recipients who were immunised after transplantation seroconverted to anti-HBs;
- The frequency of *de novo* acute hepatitis B post-OLT was 4/171 (2.3%) in non-immunised patients.

In another study,³ 140 patients with cirrhosis without past or current hepatitis B infection, and awaiting liver transplant, were given 40 mg (i.e. a double dose) of Engerix B - at 0, 1 to 2, and 2 to 4 months. Anti-HBs testing was carried out 1 to 3 months after completing vaccination. Post-vaccination data showed a 37% seroconversion rate, of whom 35% lost anti-HBs during the post-transplant follow-up period. One hundred and thirty-seven patients underwent liver transplantation during the study period (4 years), and three patients (2.2%) developed *de novo* hepatitis B. Livers transplanted from anti-HBc-positive donors were the source of *de novo* hepatitis B in all cases. Two of the three patients who developed *de novo* hepatitis B were immunised before transplantation and one of them was a responder. It was concluded that, although the response rate to double-dose recombinant vaccines is higher than the previously reported response to single-dose vaccine, it still is less than optimal. Nevertheless, opportunities for vaccination should continue to exist for transplant patients.

Improving compliance for vaccination in multiple-transfused patients

Improvement of compliance for hepatitis B vaccination among these patients includes:

- Facilitating information on prevention of hepatitis B among risk groups;
- Screening for HBV markers at first admission;

- Establishing easy-to-follow protocols;
- Improving monitoring of seroconversion;
- Introducing new vaccines intended to induce rapid seroconversion; these vaccines should require, if possible, fewer doses.

Straightforward guidelines for defined risk groups should be formulated and targeted to public health services, national and international transplant organisations, as well as specialty and sub-specialty (e.g., transplantation, infectious diseases, paediatrics, internal medicine, gastroenterology, haematology) associations.

Improving performance of hepatitis B vaccines may also help contribute to enhanced compliance through dose or schedule modifications, innovative techniques resulting in reduction of non-response rates, and development of more immunogenic vaccines for special risk groups.

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Based on a presentation by Dr Daniel Shouval, Hadassah University Hospital, Jerusalem, Israel.

Hepatitis B in the prison population

The most common characteristics of prisons (detention/correctional facilities) are a rapidly growing captive population, composed mainly of young adult males living in overcrowded conditions, with access to unauthorised drugs, and generally provided with lower levels of health care than outside prison. Such settings provide ideal conditions for HBV transmission and other viral agents, such as HCV and HIV, thereby putting staff and inmates at high risk of infection.

Injecting drug use and sexual activity among men

Injecting drug use is the main risk factor for HBV infection among prisoners. The problem is compounded by limited access to injecting equipment in prisons, which has led to an increase in sharing of injection equipment. Sexual activity among male prisoners is also a high-risk factor.

While detailed epidemiological data about HBV infection are not available for the general population of Ireland, it is known that the prevalence of the disease is low among first-time blood donors (1/4,000) and among women in antenatal care (1/3,000).¹ The current vaccination policy for prisoners in the Republic of Ireland is to offer vaccination to all prisoners with sentences of eight months or longer.

A two-part census survey was undertaken among prisoners in the Republic of Ireland to determine the prevalence of anti-HBc and antibodies against HCV and HIV, and to examine risk factors for infection.

Part I of the survey

Part I, a national cross-sectional or census survey,² was carried out between September and November 1998, and was based on a four-page written questionnaire and oral fluid samples for testing antibodies to HBV, HCV, and HIV. The results were based on completed questionnaires and fluid samples of 1,205 prisoners within nine out of fifteen prisons in the Republic of Ireland, representing 45% of the total Irish prison population at the time of the survey. All fifteen prisons were classified as high, medium, or low risk, based on the prevalence of HBV, HCV, and HIV infection. Of the prisons participating in the survey, five were classified as high risk, all in Dublin, and four, all outside of Dublin, were classified as medium risk.

Reported drug use

Of the 1,178 respondents to the questions on injecting drug use:

- 43.2% reported having injected drugs, of whom nearly 82% reported also having smoked heroin;
- 10% reported smoking heroin but not injecting drugs;
- 20.4% of IDUs reported injecting drugs for the first time while in prison;
- Of 492 IDUs, 70.5% reported sharing needles while in prison compared with 45.7% sharing needles in the month before imprisonment;

- Of 330 injectors in prison for more than 3 months, 44.9% reported injecting drugs in the previous month in prison;
- Of 497 injectors, 37.2% reported being on a methadone programme before committal, with 80% reporting injecting drugs in the month before imprisonment.

Sexual activity

Of the 1,108 respondents to questions on sexual activity:

- 2.5% reported having had anal sex with another man before committal, of whom 60% reported never having used condoms;
- 1.8% reported having had anal sex with another man while in prison.

Hepatitis B vaccination

Of the 1,143 respondents to questions regarding vaccination:

- 26.2% reported having completed a three-dose schedule of hepatitis B vaccination;
- 17.4% reported having received one or two doses of hepatitis B vaccine;
- 47.1% reported not having received any hepatitis B vaccine;
- Vaccine uptake was higher among IDUs (59.7%) than among non-IDUs (31.2%);
- Vaccine uptake was higher among those in prison for more than three of the past ten years (60.8% v 30.1%).

Conclusions

The prevalence of anti-HBc among prisoners in the Republic of Ireland is similar to that in the United Kingdom, despite the higher proportion of IDUs in Irish prisons. Twenty-six percent of Irish prisoners reported completed vaccination, a percentage that is higher than in other prison populations and in other populations of IDUs.³

There were anomalies between self-reported HBV infection and oral fluid assays. It would appear that self-reported infection status is unreliable and should not be used as a basis for planning and treatment services for prisoners. Prisoners who are not aware of being infected may continue to transmit infection through high-risk behaviour, such as injecting drugs and unprotected sexual activity. Others, who mistakenly believe they are already infected, may participate in high-risk behaviour and, as a result, become infected. It is clear that reduction of risk behaviour is linked with knowledge of infection status, together with appropriate education and vaccination programmes to reduce the risk of transmission.

The data from this study suggest that Ireland's current vaccination policy of targeting prisoners as a special risk group may be having a positive effect in lowering the prevalence of HBV infection. Nevertheless, further measures are needed on the part of health care providers to focus on preventive efforts regarding injecting drug use.

Part II of the survey

The 1997-1998 census survey described above was followed by a second phase of research among committal (i.e. short-term) prisoners between April and May 1999.⁴ Five out of the seven prisons agreed to take part in the survey, of which three were considered high risk, and two medium risk. The response rate was 96%, representing 607 out of 633 prisoners, with 596 (98%) among them agreeing to provide an oral fluid sample.

Reported drug use

- 30.8% reported having smoked heroin during the last year;
- 29% reported having injected drugs;
- 35% of all respondents reported having used heroin;
- Most of those who had smoked heroin in the last year had also injected drugs, and vice versa;
- 16% of the respondents under 18 years of age reported smoking heroin in the last year, and the same percentage under 18 reported having injected drugs.

Reported sexual behaviour and risk factors in committal prisoners in the Republic of Ireland

Risk factor	Number/total (%) of IDUs + non-IDUs	Number/total (%) of IDUs	Number/total (%) of non-IDUs
Heterosexual intercourse in the 12 months prior to committal	539/536 (90.4)	159/171 (93.0)	380/424 (89.6)
Number of heterosexual partners in the last year			
1-2	340/536 (63.4)	104/157 (66.2)	236/379 (62.2)
3-9	149/536 (27.8)	43/157 (27.4)	106/379 (28.0)
> 10	47/536 (8.8)	10/157 (6.4)	37/379 (9.8)
Condom use during heterosexual intercourse	253/531 (47.6)	64/155 (41.3)	189/376 (50.3)
Men who have ever had sex with men	9/560 (1.6)	2/148 (1.4)	7/411 (1.7)
Condom use during male homosexual intercourse	4/8 (50.0)	1/2 (50.0)	3/6 (50.0)
Men who have ever had anal sex with men in prison	3/354 (0.9)	1/131 (0.8)	2/222 (0.9)
Ever paid for any type of sex	26/559 (4.6)	8/148 (5.4)	18/410 (4.4)
Ever been paid for any type of sex	15/601 (2.5)	12/171 (7.0)	3/429 (0.7)
Ever been treated for sexually transmitted infections	44/600 (7.3)	27/171 (15.8)	17/428 (4.0)

Reported drug use in prison

- 4.9% of the 607 respondents (or 17.3% of injectors) started injecting drug use in prison;
- 40.3% reported needle-sharing while in prison compared with 30.8% reporting similar behaviour in the month before committal;
- 43.4% reported sharing syringes in prison compared with 33.1% who reported sharing outside prison.

Sexual behaviour

The sexual risk factors reported by respondents are shown in the table on the previous page. The researchers have indicated that the questions on these subjects were the least likely to have been answered truthfully.⁴

Uptake of hepatitis B vaccine

Self-reported vaccine uptake appeared to be quite low, with only 9.8% of the respondents reported having received three doses of hepatitis B vaccine, 11.7% having received one or two doses, and 78.5% not having received the hepatitis B vaccine at all. Coverage was higher in those who had previously spent time in prison. This is shown in the following table.⁴

Reported hepatitis B vaccination coverage in committal prisoners in the Republic of Ireland

Category	Number/percentage that received 3 vaccine doses	Number/percentage that received 1-2 vaccine doses	Total that received no vaccine doses	number
All respondents	55/9.8	66/11.7	442/78.5	563
Respondents who previously spent time in prison	50/13.2	62/16.4	266/70.4	378
Hepatitis B-negative respondents	49/9.4	59/11.4	410/79.1	518

Conclusions

The committal population, compared with the resident population in the census survey (Part I), included a higher proportion of younger prisoners, and those who had spent less than three months in the last ten years in prison. In the committal population, injecting drug use was significantly lower. However, the prevalence of infections among IDUs was similar in both surveys, and reflects the prevalence found among IDUs in the community.⁴ While the prevalence of sexually transmitted infections in the Irish prison population has not yet been assessed, there is a well-established link between HIV and HBV infection.

Hepatitis B in travellers

Several types of viral hepatitis are among the most common illnesses to affect travellers. While risk factors have been identified, persons travelling abroad, particularly to exotic holiday destinations, tend to be less cautious in modifying their behaviour.

Travellers comprise several main groups, including people on business trips, tourists, migrants (i.e. persons living outside their own country for political, economic, or other reasons, based on

Hepatitis B vaccination was low in both surveys, particularly among the committal prisoners. Vaccination was targeted towards long-term prisoners but not towards those who are hepatitis B-negative. Completion of vaccination was lower among IDUs, possibly because the importance of completing the schedule was not clear to the prisoners or because they may have felt the vaccine was not important or useful.

The results of the survey suggest that prisoners need to be made aware of the purpose of completed scheduled doses, and to be aware of the risk behaviour that leads to HBV and other viral infections.

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Based on a presentation by Dr Joseph Barry, Department of Community Health and General Practice, Trinity College, Dublin, Republic of Ireland.

necessity or through their own choice), military personnel posted abroad, airline personnel, persons employed by multinational corporations, personnel of other types of organisations working abroad, and governmental staff.

Factors contributing to the spread of HBV infection

High-risk factors include treatments requiring invasive procedures (injections, intravenous drips, sutures), dental treatment, attending

a bleeding person, cosmetic and other practices involving skin perforation (tattooing, acupuncture, ear and other body piercing, scarification, circumcision, etc.), and sexual contact.

Commonplace situations may also present potential risks for infection, such as sharing personal grooming items (toothbrushes, razors, etc.), applying or undergoing cosmetic procedures (haircuts, facials, massages, manicures, etc.), and taking part in sports with exposure to risk of injury, resulting in blood contact with an infected person.

Casual sex among travellers, particularly unprotected sex, is a key factor in hepatitis B virus transmission. Six studies provide collective data on percentages of travellers engaging in casual sex while travelling abroad. The results are summarised in the table below.

Casual sex in travellers

Country or region of origin of the traveller	Destination of the traveller	Percentage of casual sex travellers involved in casual sex	Study
England	Overseas	5	Conway, 1990
Switzerland	Kenya	4	Stricker, 1990
Switzerland	Thailand, Brazil	6	Milano, 1992
Canada (Ontario)	Overseas	4	Keystone, 1998
Canada (Quebec)	Overseas	9	Tessier, 1998
Germany	Developing country	20*	Kleiber, 1994

* Men travelling alone

Unsafe injections and HBV infection

Receiving medical treatment while abroad, either for underlying medical conditions or for treatment of injuries sustained during travel, presents a high-risk situation, particularly in developing countries where there is a potential danger of becoming infected through contaminated needles, medical equipment, and unsafe blood supplies for those requiring transfusions.

In developing countries, unsafe injections occur routinely. Fifty to ninety percent of injections are unsafe in fourteen out of nineteen developing countries examined.¹ Twenty to eighty percent of new HBV infections may be attributed to unsafe injections, which would account yearly for eight to sixteen million infections worldwide.²

Travellers to areas of high endemicity - prognosis for 2010

According to statistics from the World Trade Organisation, the projected number of travellers from industrialised countries to areas of high endemicity will be approximately 50 million in the year 2010. More details of this projection are given in the table below.

Destination	Country or region of departure		
	USA/Canada	Europe	Japan
Africa	500/4.5	6,200/5.4	60/7.2
Middle East	600/10.0	3,700/11.0	100/9.0
South Asia	400/7.7	1,800/6.8	160/6.0
East Asia/Pacific	5,000/5.5	9,300/7.2	11,000/6.0
Americas	75,000/3.2	16,000/5.8	5,300/6.9
Europe	18,000/2.0	275,000/2.4	5,800/5.4
Long haul increase	26.4%	11.8%	50.2%

*1995 arrivals (x 1,000)/growth per annum (%)

The endemicity of hepatitis B is intermediate or high in all African countries, Latin America, Eastern Europe, most areas of Asia (except Japan), the Pacific Islands, and Arctic areas. Travellers to such regions are at risk of HBV infection, particularly through sexual and parenteral transmission (needle-sharing, blood transfusion, injections, acupuncture, tattooing, etc.). Travel to these areas provides an ideal catch-up opportunity for vaccination. The combined hepatitis A and B vaccine is a convenient means of protection against both diseases.

Conclusions

For those who have travelled abroad and contracted HBV infection, identifying the source of infection may prove difficult. More relevant to the issue, however, is that persons engaging in high-risk behaviour still need to be protected, whether abroad or in their own country. Future travel presents an ideal opportunity for hepatitis B vaccination that may not have occurred otherwise.

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Based on a presentation by Dr Robert Steffen, University of Zürich, Zürich, Switzerland.

Increase in number of travellers projected to 2010*, according to the World Trade Organisation

Conclusions of the meeting

Based on presentations and discussions, the Viral Hepatitis Prevention Board (VHPB) formulated a number of specific conclusions for each of the risk groups.

Injecting drug users

- Hepatitis B vaccination of injecting drug users, ideally as soon as possible after the start of their drug use, is recommended.
- Injecting drug users should undergo pre-vaccination testing for serological markers of HBV infection.
- If chronic infection is diagnosed, referral of IDUs to individual care services for counselling and treatment, and referral of the IDU's household contacts and sex partners to preventive services is recommended.
- Injecting drug users, especially those known to be infected with HIV, should be subject to follow-up testing for anti-HBs after completion of their vaccination series, and to counselling if they do not respond to the vaccination. The importance of communicating the test results to clients and to their regular health care provider is recognised.
- A one-stop service integrating multiple viral hepatitis prevention services (such as prevention counselling, screening for HBV or HCV, and risk-based HAV, and hepatitis B/hepatitis A vaccination) with HIV and sexually transmitted infections services, drug rehabilitation programmes, and other drug-related services, should be established.
- The establishment of needle-exchange programmes, as an efficient means of preventing HBV infection and other blood-borne infections, is recommended.
- The client's anonymity should be guaranteed and his identity known only by a unique code number.

Health care and other workers with occupational risks for hepatitis B

- The level of risk of HBV infection among health care workers, trainees, and those in related occupations is dependent upon the frequency of their percutaneous or permucosal exposure to blood or other body fluids.
- As a consequence, hepatitis B vaccination is recommended for the following groups: (1) Health care workers with frequent exposure to blood or other body material; (2) Students or trainees upon their acceptance to schools of medicine, dentistry, nursing, laboratory technology, or related areas, prior to their first potential contact with blood in a professional setting; (3) Interim health care workers, all the more so since this group is less subject to monitoring than health care workers with a permanent appointment.
- Many other occupational groups face the risk of exposure to blood or other body fluids and are therefore at risk of hepatitis B virus infection. Risk assessment should be performed on the basis of: (1) The prevalence of markers of past or current HBV infection in such groups; (2) The reported frequency of exposure to blood or other body

fluids in these groups, taking geographical differences in endemicity into account.

- The need to consider vaccination strategies is recognised for groups of individuals with: (1) A higher reported prevalence of hepatitis B (e.g., tattooists); (2) Firemen, policemen, waste disposal workers, and other utility workers, who are potentially at risk of frequent exposure to blood or other body fluids, despite the fact that the prevalence of HBV markers in these categories is not higher than in the general population.
- A compilation of all bibliographic information on diseases that may be contracted as a result of performing other specific tasks would be most valuable when considering additional risk-group recommendations and risk-assessment criteria.

Sex workers

- Sex workers include all persons who provide sex for money or other forms of remuneration. Sex workers are at occupational risk of sexually transmitted infections, including hepatitis B. For this group, see also the conclusions below for 'Persons who engage in unsafe sexual behaviour.'
- Routine immunisation of all sex workers is recommended, irrespective of their legal status.
- Hepatitis B immunisation should be free of charge for this group, because many sex workers are not covered by health insurance and have only limited access to health care services.
- It is recognised that special attention should be given to: (1) Vaccination programmes adapted to the needs of this group; (2) Health education messages addressed to sex workers and their clients; (3) Confidentiality and appropriate counselling; (4) Anonymity achieved, e.g., by assigning a unique code number to the sex worker; (5) Promotion of outreach programmes and accelerated vaccination schedules, to guarantee higher vaccination coverage.

Persons who engage in unsafe sexual behaviour

- Hepatitis B vaccination is recommended for all adolescents and adults who engage in unsafe sexual behaviour. These groups include: (1) Heterosexuals having sexual contact with HBV infected persons or with multiple partners; (2) Men who have sex with men; (3) Persons attending sexually transmitted infections clinics; (4) Sex workers.
- A one-stop service should be established integrating multiple viral hepatitis prevention services (such as prevention counselling, selective screening for HBV or HCV, and hepatitis B vaccination) together with HIV and sexually transmitted infections services.
- Pre-vaccination screening of sexually active homosexual and bisexual men is recommended.
- Persons who engage in unsafe sexual behaviour should be subject to follow-up testing for anti-HBs after completion of their vaccination series, and to counselling if they do not respond to the vaccination. ➡

- If chronic hepatitis B infection is diagnosed, referral of clients to individual health care services for counselling and treatment, and referral of the clients' household contacts and sex partners to preventive services is recommended.
- The importance of the expansion of outreach programmes and the integration of vaccination and information programmes (e.g., for MSM) into non-clinical sites is recognised.

Household and other social contacts of persons with HBV infection

- Persons who have casual contact with acute hepatitis B patients or chronic HBsAg carriers at schools and offices are at low risk of catching HBV infection.
- Hepatitis B vaccination is not recommended for these persons unless in special circumstances, such as the occurrence of behavioural problems (biting or scratching) or medical conditions (severe skin disease) that might facilitate transmission.
- Some European countries recommend vaccination of day-care children and staff where they have contact with high-risk children.
- Vaccination of all household contacts of persons identified as acute hepatitis B patients or chronic HBsAg carriers is recommended.

Pregnant women and at-risk neonates

- In general, where universal screening of pregnant women for HBsAg exists, countries may wish to continue such screening programmes.
- Women who present for delivery without having been screened during their pregnancy should be tested immediately, and their newborns vaccinated within twelve hours after birth, irrespective of the screening test results.
- Infants born to mothers who are HBsAg-positive should receive the hepatitis B vaccine within 12 hours (and certainly not later than 24 hours) after birth. As no sufficient data supporting the additional value of administering HBIG at birth are available, this procedure is not recommended. This point of view is, however, not intended to promote modification of currently implemented national policies.
- Efficient implementation of universal screening procedures for pregnant women and vaccination of newborns requires: (1) Awareness among public health authorities, health care providers, and the general public of the importance of prevention of HBV infection; (2) A well-organised structure; (3) Trained personnel; (4) Good communication; (5) Sufficient resources and supplies (needles, vaccines, etc.).
- In general, where maternal screening programmes do not exist, the available resources may be better directed towards universal neonatal immunisation programmes.
- Control of perinatal transmission can be achieved if the first dose of vaccine is delivered at birth.

Haemodialysis patients and patients receiving blood or blood products

- Screening for hepatitis B markers in blood donors is recommended. ➔

- Pre-vaccination testing for hepatitis B markers in patients who have already received multiple blood transfusions is recommended.
- Vaccination of the following groups is recommended: (1) Haemophiliacs and those frequently receiving blood or blood products; (2) Haemodialysis patients and candidates for haemodialysis, who should be vaccinated early in the course of their renal disease; (3) Transplant patients and candidates for transplant.
- These patients should be subject to follow-up testing for anti-HBs after completion of their vaccination series, and to counselling if they do not respond to the vaccination. Booster vaccination is recommended for all of them, to maintain protective levels of antibody.
- HBsAg-positive haemodialysis patients and haemodialysis machines should be isolated.
- Staff in haemodialysis units should be vaccinated prior to their first contact with haemodialysis patients.
- Patients receiving clotting-factor concentrates should receive subcutaneous hepatitis B vaccination, as soon as possible after diagnosis of their clotting disorder.

Prisoners and prison staff

- Common objectives should form the basis for hepatitis B prevention programmes within European prisons.
- Hepatitis B vaccination for all inmates upon entry into prisons or correctional facilities is recommended.
- Vaccination policies that link vaccination of prison staff and prisoners in order to achieve higher vaccine uptake levels should be considered.
- The introduction of accelerated immunisation schedules with the aim of achieving higher vaccine uptake levels among prisoners is recommended.
- Post-vaccination anti-HBs levels among prisoners and staff should be tested and recorded.
- Inmates injecting drugs should be permitted access to drug rehabilitation programmes.
- Confidential computerised records should be introduced.

Travellers

- Hepatitis B is of intermediate or high endemicity in all African countries, Latin America, Eastern Europe, most parts of Asia (except Japan), the Pacific Islands, and Arctic regions.
- Travellers to such countries are at risk of HBV infection, particularly through sexual transmission and through percutaneous transmission, via needle sharing, blood transfusion, injections, acupuncture, tattooing, etc. Travel to these areas provides an ideal catch-up opportunity for hepatitis B vaccination.
- Hepatitis B vaccination of the following groups or individuals when travelling to areas with intermediate or high endemicity is recommended: (1) Travelling health care workers; (2) Young children who will be in day-care or residential settings; (3) Travellers likely to engage in sexual or needle-sharing activities; (4) Travellers who may need to undergo medical or dental procedures; (5) Travellers planning to undergo invasive cosmetic procedures; (6) Other travellers staying in areas of intermediate or high endemicity for more than one month, and frequent travellers making shorter trips to these areas.

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NEWSFLASH**ACIP votes on birth dose of hepatitis B vaccine**

On October 16, 2001, the Advisory Committee on Immunization Practices (ACIP) voted to change its recommendation regarding the timing of the first dose of hepatitis B vaccination for infants of low-risk women. ACIP voted to recommend a birth dose of hepatitis B vaccine for all infants, which means that the first dose of hepatitis B vaccine should be administered between birth and hospital discharge. Only for infants of mothers whose HBsAg test is assured to be negative does ACIP now consider allowing administration of the first dose as late as 2 months of age.

Since 1991, ACIP has offered two recommended infant hepatitis B vaccination schedules and each had equal weight. In the first option, the first dose is given prior to hospital discharge; in the second option, the first dose is given anytime up to 2 months of age. The new recommendation will formally favor the first option. The ACIP recommendation will now agree with American Academy of Pediatrics (AAP) policy, which since 1992 has been to recommend a birth dose for all infants and to refer to an alternative schedule beginning with a dose at 2 months as 'acceptable.' The ACIP has not changed its hepatitis B vaccination recommendation for infants of HBsAg-positive mothers and infants of mothers whose HBsAg status at the time of delivery is unknown. These infants should be given HBIG and hepatitis B vaccine or just hepatitis B vaccine, respectively, within 12 hours of birth, not just anytime prior to hospital discharge.

The ACIP vote will become an official recommendation upon publication in the Recommended Childhood Immunization Schedule for 2002, which will appear in the *Morbidity and Mortality Weekly Report* and elsewhere in January 2002.

Source: IAC EXPRESS 2001; 279, October 29.



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