Impact of universal vaccination programmes on the epidemiology of hepatitis B in Italy (SEIEVA results)

Milano
November 17, 2011

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Istituto Superiore di Sanità
Main modes of HBV transmission before vaccination era

- Vertical and horizontal transmission
- Sexual transmission
- Reused syringes/needles
Prevalence of HBV markers in two samples of 7-12 yrs old children enrolled in Naples 8 yrs apart

<table>
<thead>
<tr>
<th></th>
<th>1980</th>
<th>1988</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HBsAg</td>
<td>2.1%</td>
<td>0.8%</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Any HBV marker</td>
<td>11.7%</td>
<td>6.8%</td>
<td>&lt; 0.05</td>
</tr>
</tbody>
</table>

Prevalence of HBV markers of hepatitis B in two national samples of Italian recruits enrolled 9 yrs apart.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total no. tested</th>
<th>HBsAg* positive</th>
<th>anti-HBc* positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>5,005</td>
<td>3.4%</td>
<td>16.8%</td>
</tr>
<tr>
<td>1990</td>
<td>4,993</td>
<td>1.6%</td>
<td>5.8%</td>
</tr>
</tbody>
</table>

* HBsAg, hepatitis B surface antigen; anti-HBc, hepatitis B core antibodies.

D’Amelio, AJE 1992

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HBsAg Prevalence of pregnant women by region

1984-1986

(2.4%)

NA* Not Available
Mothers <14 e >55 yrs not included

Stroffolini T, I.J.G., 1988

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At the end of eighties Italy was a country at medium endemicity of HBV with about 2 million chronic carriers
Vaccination in countries at intermediate endemicity: Italy

1983: Vaccination of high risk groups

1991: Vaccination of infants and adolescents
Italian strategy for hepatitis B vaccination

Vaccination of 12-years-old

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1991
2003
STOP

years

0 12 24

age

0 12 24
Hepatitis B. Yearly trend in incidence rates
SEIEVA 1985-2010

Universal HBV vaccination

Incidence rates x 100,000


0-14
15-24
≥25
Totale

0
5
10
15
20
25
30
35
40
45

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Distribution of notified Hepatitis B cases by age
SEIEVA 2006-2010

<table>
<thead>
<tr>
<th>Età</th>
<th>% di casi</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-14</td>
<td>0,32</td>
</tr>
<tr>
<td>15-24</td>
<td>5,19</td>
</tr>
<tr>
<td>25-34</td>
<td>23,56</td>
</tr>
<tr>
<td>35-54</td>
<td>53,62</td>
</tr>
<tr>
<td>55+</td>
<td>17,31</td>
</tr>
</tbody>
</table>

2 Italians
6 Foreign

29 Italians
99 Foreign
Cases of notified acute hepatitis B by nationality
SEIEVA 2006-2010

- Italia: 84%
- Africa: 20.4%
- Central and South America: 8.9%
- Asia: 14.5%
- East Europe: 54.6%
- Western Europe: 1.3%
- Altro: 16%
### Risk factors for acute hepatitis B
#### SEIEVA 2006 - 2010

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>O.R.</th>
<th>(C.I.)</th>
<th>P.A.R.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.V. drug users</td>
<td>2,2</td>
<td>(1,3 - 3,9)</td>
<td>2,1%</td>
</tr>
<tr>
<td>Surgical Intervention</td>
<td>1,7</td>
<td>(1,3 - 2,4)</td>
<td>5,5%</td>
</tr>
<tr>
<td>Other nosocomial exposures</td>
<td>1,8</td>
<td>(1,2 - 2,8)</td>
<td>4,2%</td>
</tr>
<tr>
<td>Other parenteral exposures</td>
<td>2,4</td>
<td>(1,9 - 2,9)</td>
<td>20,1%</td>
</tr>
<tr>
<td>Dental Therapy</td>
<td>1,5</td>
<td>(1,2 - 1,8)</td>
<td>9,4%</td>
</tr>
<tr>
<td>Household of HBsAg+</td>
<td>6,4</td>
<td>(3,8 - 10,5)</td>
<td>10,1%</td>
</tr>
<tr>
<td>Never/occasional condom use</td>
<td>3,2</td>
<td>(2,5 - 4,1)</td>
<td>13,8%</td>
</tr>
</tbody>
</table>
Frequency of reported risk factors by year
SEIEVA 1991-2010

Drug users
Parenteral exposures
Household HBsAg+
Surgical intervention
Prevalence of HBsAg positive pregnant women* by region

N. 17.260

Years 2008-2009
(0,9%)

ND* Not Determined

*women <14 and >55 years are excluded

Spada E et al, J. Infection, 2011

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Prevalence of HBsAg positive pregnant women by nationality

<table>
<thead>
<tr>
<th>Nº</th>
<th>14.307</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Immigrants</td>
<td>25,0%</td>
</tr>
<tr>
<td>% tested</td>
<td>97,6%</td>
</tr>
<tr>
<td>Prevalence (%) of HBsAg</td>
<td>0,9%</td>
</tr>
<tr>
<td>Prevalence (%) of HBsAg in Italians women</td>
<td>0,4%</td>
</tr>
<tr>
<td>Prevalence (%) of HBsAg in Immigrants women</td>
<td>2,7%</td>
</tr>
<tr>
<td>Prophylaxis (%) of newborns from mothers HBsAg+</td>
<td>100%</td>
</tr>
</tbody>
</table>

Spada E et al., J. Infection, 2011

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### Prevalence of HBV markers in Abbiategrasso (Mi) 2010-2011

<table>
<thead>
<tr>
<th>Age</th>
<th>N.</th>
<th>Anti-HBc (%)</th>
<th>HBsAg (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-34</td>
<td>379</td>
<td>7 (1.9)</td>
<td>4 (1.1)</td>
</tr>
<tr>
<td>35-44</td>
<td>385</td>
<td>24 (6.2)</td>
<td>3 (0.8)</td>
</tr>
<tr>
<td>45-54</td>
<td>395</td>
<td>58 (14.7)</td>
<td>3 (0.8)</td>
</tr>
<tr>
<td>55-64</td>
<td>331</td>
<td>75 (22.7)</td>
<td>7 (2.1)</td>
</tr>
<tr>
<td>65+</td>
<td>276</td>
<td>91 (33.0)</td>
<td>5 (1.8)</td>
</tr>
<tr>
<td>All ages</td>
<td>1766</td>
<td>255 (14.4)</td>
<td>22 (1.3)</td>
</tr>
</tbody>
</table>

*M. Zuin, in preparation*
Currently HBV burden of disease in Italy

<table>
<thead>
<tr>
<th></th>
<th>HBV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic carriers</td>
<td>600,000</td>
</tr>
<tr>
<td>Cirrhosis</td>
<td>100,000</td>
</tr>
<tr>
<td>Deaths/year</td>
<td>1,500</td>
</tr>
</tbody>
</table>

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The incidence of HBV infection in Italy dramatically declined in the last few decades. At the end of the 1980’ there were about 2 million chronic carriers in Italy. Today the prevalence of chronic carriers is about 500,000.

Universal vaccination of infants and adolescents combined with improved social and economic condition contributed to this phenomenon.
Conclusion

The majority of newly reported cases are unvaccinated adults.

The most important risk factors for newly acquired infection are: sexual contacts with infected individuals, beauty treatments (i.e. pedicures, tattoos) iatrogenic exposure and intra-venous drug use.

Immigrants represent 16% of newly reported cases.