Update of the universal vaccination programme in Italy

Progress in the prevention and control of hepatitis B in Italy, 12 years after the implementation of universal vaccination.

Duration of immunity and booster policy to maintain lifelong protection.
## Hepatitis B vaccination in Italy

### Historical aspects

<table>
<thead>
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<th>Year</th>
<th>Events</th>
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<td>1983</td>
<td>- Selective immunisation of people at increased risk of HBV infection</td>
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| 1991 | - Mandatory universal vaccination for infants and 12-years-old adolescents together with mandatory HBsAg screening of pregnant women  
     - Vaccination continued to be offered free of charge to high-risk groups |
HBV vaccination

Safety profile (2003)

- Over than 12 million children have been vaccinated with an outstanding record of safety and efficacy.

- Reported adverse reactions are generally mild and confined to symptoms at the site of injection.

- Major neurological syndromes (2 cases of GB but not MS) were reported in less than 1 case x $10^6$ doses injected.
HBV vaccination - Coverage

- Globally, the coverage rate is at least 95% with somewhat lower acceptance in South (~80%) compared to Northern regions (100%).

- Coverage rate among HCWs (~65%) and among household contacts is still insufficient highlighting regional differences between North and South.
Incidence (x $10^5$ inhabitants) of acute hepatitis B in Italy, by age (1985-2002)
Decline of hepatitis B incidence following the national vaccination program - I

- During the period 1991-2003 the overall number of new cases of hepatitis B dropped by 80% compared with data for 1985-90 period.

- Reduction is even more striking among individuals aged 15-24 years.

- No clinically overt hepatitis has been reported so far in vaccine recipients.
HBsAg mutants

Occasional breakthrough infections due to G145R mutant or to less frequent S-gene mutants (P120S, P127S) have been reported in liver transplant recipients and in children born to HBsAg carrier mothers.

There is no evidence, at present, that S gene mutants may pose a threat to the established program of HB vaccination in Italy.
Decline of hepatitis B prevalence following the national program of vaccination - II

• Serologic studies have recently shown a drop near to zero of HBV markers among children and teenagers, in the last decade.

• In parallel with the decline of hepatitis B, hepatitis Delta has also declined significantly, in Italy.
Changing pattern of hepatitis B in Italy

Conclusions

Hepatitis B has progressively declined in the last 20 years as a result of:

- Social behavioural and demographic changes.
- General improvements in the standard of living and hygiene.
- Introduction of public health measures such as refinement in blood screening, use of universal precautions in medical setting and implementation of vaccination.
HBV vaccination in Italy

*Future holds*

- Maintaining mandatory vaccination of infants and HBsAg testing of pregnant women.
- Catch up immunisation of unvaccinated adolescents.
- Increasing vaccination coverage in high risk groups.
- Considering the use of booster dose(s).
Italian strategy for hepatitis B vaccination

- Age 24 years
- Age 12 years
- Age 0 years

Vaccination of 12-years-old

Years:
- 1991
- 2003

STOP
Hepatitis B vaccination: persistence of immunity

- How long can vaccine-induced immunity be expected to last?
- Will vaccinated babies maintain immunity until the time when risk behaviour may be expected?
- Is there a need for booster vaccination(s) to sustain immunity?
Study population (1)

1212 children* (50.5%M, 49.5%F) vaccinated at birth (3, 5, 11m)

**Year of vaccination:**
1992 (69.9%) 1993 (30.1%)

**Mean age (at enrollement):**
10.9 years

**North** 30.7%  **South** 69.3%

* all born to HBsAg - mother
Study population (2)

521 Italian recruits
vaccinated at 12 years of age

Years of vaccination: 1992-93
Mean age (at enrollment): 21.6 years

North 25.5%  South 74.5%
Methodology

2003: testing for anti-HBc and anti-HBs (titre)

- anti-HBc+
- HBsAg
- HBV DNA sequencing

administration of 1 booster dose

15 days later: anti-HBs titre

- anti-HBs <100mIU/ml
- anti-HBs ≥100mIU/ml

- STOP

2 additional doses of vaccine

- anti-HBs >10mIU/ml
- considered immune
Conclusions

Preliminary data provide evidence that a strong immunologic memory may persist 11 years after immunization of healthy infants and children with a primary course of hepatitis B vaccination. Consequently booster doses of vaccine seem not to be strictly required to maintain life-long protection.
Participants

Zanetti AR, Romanò L, Milano
Mele A, Mariano A, Marzolini F, Stroffolini T, Tosti ME, D’Amelio R, Roma
Coppola RC, Masia P, Sardegna
Cuccia M, Mangione R, Sicilia
Negrone FS, Maldini M, Basilicata
Parlato A, Campania
Quarto M, Chironna M, Puglia
Ragni P, Farneti M, Marrone F, Amadori D, Emilia Romagna
Zamparo E, Benedetti D, De Battisti F, Friuli
Zotti C, Montù D, Piemonte