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The role of MeNZB vaccination in controlling the New Zealand meningococcal epidemic

New Zealand's epidemic of meningococcal disease, which began in 1991, has now largely abated. An intensive immunisation campaign offered to all young New Zealanders under 20 years of age (2004–2006) with an impressive 80% coverage for 3 doses of vaccine[1] has played an important role in this decline.[2,3]

The role of vaccine in this process is likely to have been that of a "circuit breaker" with a large proportion of the population at greatest risk (the under 20 year olds) successfully immunised in a very short timeframe.

The reasoning behind the use of MeNZB, a strain-specific Outer Membrane Vesicle vaccine especially manufactured for New Zealand using the New Zealand serogroup B meningococcal epidemic strain was based on the following:

- If a group of individuals showed an antibody response, it was likely that that group would be protected by vaccination (the protective antibody level for an individual for serogroup B vaccines is still debated). This was based on published data from Brazil.[4]
- Even very young children are able to mount a strain-specific antibody response and therefore could potentially be protected by a strain-specific vaccine.[5]
- New Zealand's epidemic was dominated (~80% at peak) by a single serogroup B meningococcal strain.

Three doses of MeNZB vaccine were recommended in most age groups knowing that 2 doses produced a short-lived effect, though by the nature of these vaccines it was unlikely that 3 doses would produce anything more than a short extension of protection.

Norway's experience highlighted this issue: the first published report signalled a 57% vaccine efficacy (in school children) after 29 months[6] but review by other investigators at an earlier time point (10 months) showed a better efficacy of 87%.[7] Very young infants (at time of routine vaccines) required 4 doses of MeNZB to achieve an antibody response likely to protect.

Studies, ongoing at the time of the immunisation programme, have provided supportive information that indeed MeNZB vaccination is not likely to provide long-term protection.[8,9] In the youngest age group studied (6–8 month old infants) only 12.5% were sero-responders, i.e. had antibody likely to protect at 7 months after the third dose of vaccine.

New Zealand has continued to offer vaccine to young infants who become eligible by age for the New Zealand vaccine immunisation schedule. Coverage for the fourth dose of vaccine necessary in this age group has been poor (less than 50%) (Ministry of Health data).

Thus, since late 2005, in the highest risk areas where the immunisation programme began (northern New Zealand), most children are likely not to have had antibody protection against the New Zealand meningococcal epidemic strain. Despite this, the decay of the epidemic continues.[10] In addition, it is well documented that serogroup B meningococcal epidemics naturally decay over 10–15 years.[10]

It therefore seems reasonable that MeNZB vaccination be withdrawn from the New Zealand infant immunisation schedule. The introduction of 7 valent pneumococcal conjugate vaccine in June 2008 could be an appropriate time. Invasive pneumococcal disease has now risen to number one as the most important vaccine-preventable invasive bacterial pathogen.[11]

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