Editorial: Diphtheria - the Australian perspective

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Diphtheria has been a major cause of morbidity and mortality in Australian history. A decline in the incidence of this disease began with the implementation of public heatlh measures before the infective nature of the disease was understood. The death rate was greatly reduced when antiserum became available a century ago. Active immunisation began in the 1920s. This was in widespread use by the 1940s and led to the almost complete elimination of the disease by the 1960s. However sporadic cases have continued to occur in unimmunised individuals. In 1984 the National Health and Medcal Research Council recommended the use of ADT (adult diphtheria-tetanus toxoid) in place of tetanus toxoid for adult booster immunisation.

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Death from diphtheria in Australia is now rare. However notifications of bacteriologically proven diphtheria-related conditions continue to occur. The National Notifiable Diseases Surveillance System recorded eight cases in 1991, 14 in 1992 and one in 1993[1]. Toxigenic as well as non-toxigenic strains of *Corynebacterium diphtheriae* remain endemic in parts of Australia[2].

The most important lesson to be learnt from recent outbreaks in the former Soviet Union, is that diphtheria recurs when community susceptibility increases and toxigenic organisms recirculate. In Australia many adults will now be susceptible, even if previously immunised, because of lack of natural boosting. This is a direct result of previous success in eradicating the organism from the community. We now have a large population of individuals whose only protection came from childhood immunisation. They have had no subsequent boosting either from further vaccine or from occasional contact with the organism. In the former Soviet Union there was social disruption and a considerable reduction in childhood immunisation. This provided conditions which enabled imported diphtheria to spread more easily resulting in a high incidence of disease, particularly in adults whose immunity had lapsed.

There have been no diphtheria serosurveillance studies carried out in Australia recently. However, using the international standard of susceptibility (antitoxin <0.01 IU/mL), 35% of United Kingdom-born blood donors aged 40 to 49 years are susceptible, and 53% of those aged 50 to 59[3]. It can be assumed that similar rates would apply in Australia, the United States of America and the former Soviet Union up until 1990. Spread of toxigenic *C. diphtheriae* into a susceptible Australian population could be expected to produce outbreaks and deaths. It should not be forgotten that there is no effective treatment for diphtheritic myocardiopathy, which is commonly fatal.

Some countries close to the former Soviet Union such as Finland and Poland have commenced adult immunisation against diphtheria. In Australia there appears to be no cause for alarm at present. However the possibility of a resurgence of diphtheria must be acknowledged. The following measures are pertinent:

- improving the uptake of childhood immunisation, to reduce the number of susceptible children and hence spread of any imported organism in the community;
- maintaining adequate surveillance, which must include maintaining skills in bacteriological diagnosis, even if only at selected laboratories. The European experience detailed by Dr Gilbert, in this issue, should assist in choosing the best approaches;
- achieving better adult immunisation, especially in migrants arriving without evidence of adequate childhood immunisation. Also for Australians intending to travel to areas where diphtheria is endemic;
- being prepared to embark upon localised mass immunisation of susceptible populations, for both adults and children, should an outbreak occur, the use of other public health interventions such as active case-finding and isolation for such outbreaks.

References

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3. Maple P, Efstratiou A, George R *et al*. Diphtheria immunity in UK blood donors. *Lancet* 1995:345:963-965.