Pertussis in NSW and its prevention in infants and children

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Pertussis is an acute respiratory tract illness caused by infection with the bacterium *Bordetella pertussis*. While pertussis affects all age groups, unimmunised and partially immunised babies are at greatest risk of severe disease and death.[1] Notification of cases of pertussis to the New South Wales (NSW) Department of Health is mandated under the NSW *Public Health Act 1991*.

Epidemiology

In countries with universal childhood vaccination, epidemics of pertussis occur periodically on a background of endemic circulation, although levels of disease activity are much lower in comparison to those in unimmunised populations. In NSW and nationally, a large epidemic unfolded from 2008. In 2008–2009, the pertussis notification rate in NSW was about three times higher than the previous 5-year average. Disease activity has continued at high levels during 2010. The relatively higher rate is likely explained by both a real epidemic as well as improved diagnoses related to the wider use of molecular-based testing (polymerase chain reaction (PCR)), which is more sensitive than other available methods.[2]

Preventing the spread of *B. pertussis* is challenging due to a number of factors including: the organism is highly infectious; immunity following vaccination and/or previous infection wanes after a few years; and adolescents and adults commonly have mild to moderate illness following infection (which can often go undiagnosed) and can unknowingly transmit the pathogen to others including susceptible infants and children.[1,3]

Vaccination schedule and coverage

It is recommended that children in Australia receive primary doses of a pertussis-containing vaccine (given in NSW in a hexavalent combination of DTPa-HepB-Hib-IPV) at 2, 4 and 6 months of age and that a booster dose (DTPa) is administered at 4 years of age. A second booster of adolescent/adult vaccine (dTpa) is recommended between the ages of 12 and 15 years, and is offered via NSW Health's School-Based Vaccination Program. The adolescent/adult dTpa vaccine is also recommended for adults who live and/or work with young children, including health professionals, new parents and those planning to have children. Pertussis vaccine coverage in NSW children under the age of 12 months is high (92.7%), although coverage and timeliness could be improved, particularly among Aboriginal children.[4]

Prevention strategies: early infant pertussis

Pertussis infection during the first 6 months of life can be life threatening as these infants are too young to have received a full primary course of vaccine. There is therefore a need for public health action to focus on preventing pertussis in early infancy. Potential vaccine strategies currently being explored that may provide direct protection include neonatal immunisation (providing the first dose of vaccine straight after birth) and immunisation during pregnancy; studies are underway investigating the effectiveness and safety of these approaches. Indirect protection may be achieved through universal, population level pertussis immunisation programs and/or targeted vaccination of those likely to be in contact with newborns such as parents and grandparents (often termed 'cocooning').[3]

In 2009 the NSW Department of Health initiated a program to minimise the spread of the organism and protect susceptible infants and children. The program comprises a number of strategies, including: a large social marketing campaign promoting vaccination and other risk mitigation behaviours; promotion of the first vaccine dose at 6 weeks of age (rather than 8 weeks) and the first booster dose at 3½ years of age (rather than 4 years); and provision of a free booster dose of pertussis vaccine for new parents (including those planning pregnancy), grandparents and carers of babies under 12 months of age.

References

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