

The impact of parental postpartum pertussis vaccination on infection in infants: A population-based study of cocooning in Western Australia

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Abstract

During a pertussis epidemic in 2011-2012 the Western Australian (WA) Department of Health implemented a 'cocooning' programme, offering free pertussis-containing vaccine (dTpa) to new parents. We assessed the impact of vaccinating parents with dTpa on the incidence of pertussis infection in newborns. Births in WA during 2011-2012 were linked to a register of parental pertussis vaccinations and to notified reports of laboratory-proven pertussis in children <6 months of age. Parents who received dTpa during the four weeks after their child's birth were defined as 'vaccinated postpartum.' Cox proportional-hazards methods were used to calculate hazard ratios (HRs) and 95% confidence intervals (CIs) for the risk of pertussis infection among infants born to parents vaccinated postpartum vs. unvaccinated parents, adjusted for maternal age, geographic region, timing of birth, and number of siblings. Of 64,364 live-births, 43,480 (68%) infants had at least one vaccinated parent (60% of mothers and 36% of fathers). After excluding records where parent(s) were either vaccinated prior to the birth, vaccinated >28 days after the birth, the vaccination date was uncertain, or the child died at birth (n=42), the final cohort contained 53,149 children, 118 of whom developed pertussis. There was no difference in the incidence of pertussis among infants whose parents were both vaccinated postpartum compared to those with unvaccinated parents (1.9 vs 2.2 infections per 1000 infants; adjusted HR 0.91; 95%CI 0.55-1.53). Similarly, when assessed independently, maternal postpartum vaccination was not protective (adjusted HR 1.19; 95%CI 0.82-1.72). Supplemental sensitivity analyses which varied the time period for parental vaccination and accounted for under-reporting of vaccination status did not significantly alter these findings. In our setting, vaccinating parents with dTpa during the four weeks following delivery did not reduce pertussis diagnoses in infants. WA now provides dTpa vaccine to pregnant women during the third trimester.

Keywords: Bordetella pertussis; Cocooning; Immunisation; Pertussis vaccine; Public health; Whooping cough.