Commentary

Fighting pertussis re-emergence: promise from vaccination in pregnancy

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The re-emergence of pertussis, a respiratory infection caused by *Bordetella pertussis*, in countries with high vaccination coverage, has become a hot public health issue.^{1–3} There is consensus that the main reason for re-emergence of this disease in such countries is the low persistence of protective memory conferred by the acellular pertussis vaccines, which have almost totally replaced the old, more reactogenic whole-cell pertussis vaccine in most developed countries.^{4,5} However, there is debate on how to face this new challenge. Since pertussis is particularly severe and can be lethal in unvaccinated newborns and infants before they have completed the primary vaccination cycle (8–12 months, depending on specific, country-related vaccination schedules), one attractive option considers vaccinating against pertussis in pregnancy (weeks 28–38 of gestation).^{6–8} This approach would protect the newborn and infants by the passive acquisition of maternal anti-*B. pertussis* antibodies through placental passage and possibly lactation. In addition, it would confer a degree of protection to the mothers which are known to be a primary source of bacterial transmission to the newborn. However, the effectiveness of this strategy has remained undefined. Now, Dabrera and collaborators at Public Health England report that vaccinating pregnant British women with the adult formulation of a tetanus, diphtheria, acellular pertussis (Tdap) vaccine is highly effective, conferring a high degree of protection to the newborn of vaccine recipients.^{9,10} Namely, in a case-control study performed in England and Wales, these authors noticed that 10 cases of pertussis occurred in infants of 58 vaccinated mothers, but 29 cases were diagnosed in 55 infants born to unvaccinated women. Although only preliminary, these data lay on rather solid ground the proposal of vaccination during pregnancy. Nonetheless, it is unclear whether other countries will follow before more extensive studies of safety and protection of dTdap vaccines in pregnancy are performed.

An alternative (or integrative) approach is improving the compliance to aP vaccine boosters at pre-school age, adolescents, and adults. In adults, there is now the highest circulation of *B. pertussis* and high incidence of moderate to mild disease. Although these boosters are gratuitously offered in many countries as part of their National Vaccination Programs, their acceptance decline dramatically with age. Both strategies aim at protecting against the severe pertussis in newborns and infants; however, the boosters strategy may more effectively reduce the bacterial transmission from adolescents and adults to infants by lowering the overall incidence of pertussis in the community. Other approaches, e.g. a cocooning strategy, are also being studied.¹¹ Of course, all these efforts would be less cogent, and costly, if we had a better pertussis vaccine, meaning a vaccine capable of generating an enduring protective memory after primary vaccination of infants. Efforts in this direction are being made,^{12,13} but it seems unlikely we can enjoy this new weapon in the near future. The sentiment tells me that we are particularly far from the enthusiasm, participation and international cooperation among vaccine manufacturers, international granting agencies, regulatory authorities, and scientists that characterized the production, vaccines and the experimental and clinical studies of acellular pertussis vaccine in the early 1990s.

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