Safety Aspects of Vaccinating Premature Infants Against Pertussis and Pneumococci – a Literature Review with Focus on Risk for Apnea and Death

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Learning points

- Post-vaccination Apnea/ABD events were described in 0 - 23 % of children born prematurely.
- There was a tendency of higher incidence of apnea/ABD events with lower gestational age at birth (Figure 1).
- No correlation was found between the chronologic age of infants at first vaccination and the occurrence of apnea/ABD events.
- Apnea occurred from 3-66 hours post-vaccination.
- Eight fatal cases were reported. No causal relationship between vaccination and death was found.

Background

Premature infants are more vulnerable to vaccine-preventable infections with pertussis and pneumococci. Cardiorespiratory instability is a feared adverse event after immunization of these infants and often leads to deferred vaccination.

We aimed to review the risk of apnea and death following the first vaccination in premature infants. Most studies did not report apnea alone, but in combination with bradycardia and/or desaturation (ABD events).

Methods

We conducted a literature review of studies published 1986 - 2017. Articles were retrieved from PubMed, Cochrane Library and Scopus. Studies where the outcomes apnea or death were assessed after vaccination with acellular pertussis and/or pneumococcal conjugate vaccines were included.

Of 3679 articles retrieved, 26 were included after reviewing full text, and 8 were included after evaluation with GRADE methodology.

Percentage ABD/apnea postvaccination in studies with different mean gestational age at birth

Discussion

The infants' cardiorespiratory stability and overall clinical condition at the time of vaccination seemed to be of importance for the risk of postvaccination apnea/ABD events.

Percentage of children with increased events varied between studies, largely due to differences in methodology and definitions of outcomes. In the only randomised controlled study in this review, no difference was seen between the vaccinated group and the controls.

One small study showed that pneumococci and hexavalent vaccines given concomitantly gave significantly higher incidence of apnea and bradycardia. There is a need for prospective studies on concomitant vaccination.