

ORIGINAL ARTICLE | [VOLUME 151, ISSUE 2, P167-172, AUGUST 01, 2007](#)

Primary Immunization of Premature Infants with Gestational Age <35 Weeks: Cardiorespiratory Complications and C-Reactive Protein Responses Associated with Administration of Single and Multiple Separate Vaccines Simultaneously

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Objective

To determine the incidence of cardiorespiratory events and abnormal C-reactive protein (CRP) level associated with administration of a single vaccine or multiple separate vaccines simultaneously.

Study design

Prospective observational study on 239 preterm infants at ≥ 2 months of age in the neonatal intensive care unit (NICU). Each infant was randomized to receive either a single vaccine or multiple vaccines on one day. CRP levels and cardiorespiratory manifestations were monitored for 7 days following immunization.



Results

Abnormal elevation of CRP level occurred in 85% of infants administered multiple vaccines and up to 70% of those given a single vaccine. Overall, 16% of infants had vaccine-associated cardiorespiratory events within 48 hours postimmunization. In logistic regression analysis, abnormal CRP values were associated with multiple vaccines (OR, 15.77; 95% CI 5.10-48.77) and severe intraventricular hemorrhage (IVH) (OR, 2.28; 95% CI 1.02-5.13). Cardiorespiratory events were associated marginally with receipt of multiple injections (OR, 3.62; 95% CI 0.99-13.25) and significantly with gastroesophageal reflux (GER) (OR, 4.76; 95% CI 1.22-18.52).

Conclusion

CRP level is expected to be elevated in the 48 hours following immunization. In a minority of infants immunized, cardiorespiratory events were associated with presumed need for intervention. Underlying medical conditions and possibly multiple injections are associated with cardiorespiratory events. Precautionary monitoring following immunizations is warranted.

Abbreviations:

[AAP](#) ([American Academy of Pediatrics](#)), [AOP](#) ([Apnea of prematurity](#)), [BPD](#) ([Bronchopulmonary dysplasia](#)), [BW](#) ([Birth weight](#)), [CPAP](#) ([Continuous positive airway pressure](#)), [CRP](#) ([C-reactive protein](#)), [DTaP](#) ([Diphtheria-tetanus-acellular pertussis](#)), [DTwP](#) ([Diphtheria-tetanus-whole cell pertussis](#)), [GA](#) ([Gestational age](#)), [GER](#) ([Gastroesophageal reflux](#)), [HBV](#) ([Hepatitis B vaccine](#)), [Hib](#) ([Haemophilus influenzae type b conjugate](#)), [IPPV](#) ([Intermittent positive pressure ventilation](#)), [IPV](#) ([Inactivated poliovirus vaccine](#)), [IVH](#) ([Intraventricular hemorrhage](#)), [NICU](#) ([Neonatal intensive care unit](#)), [PCV7](#) ([Pneumococcal 7-valent conjugated vaccine](#))

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Article Info

Publication History

Published online: June 26, 2007

Accepted: February 21, 2007

Received in revised form: December 29, 2006

Received: April 14, 2006

Identification

DOI: <https://doi.org/10.1016/j.jpeds.2007.02.059>

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