Invasive pneumococcal disease (IPD) is a serious and life-threatening condition.\(^1\) Introduction of the 7-valent pneumococcal conjugate vaccine (PCV-7) in the United States in 2000 led to a sharp reduction in the incidence of vaccine-related IPD,\(^2\) that was further decreased after introduction of the 13-valent pneumococcal conjugate vaccine (PCV-13).\(^1,3-5\) We report a cluster of cases of IPD in previously healthy vaccinated children.

**METHODS**

After observing a cluster of IPD cases among children hospitalized at Hasbro Children’s Hospital, Providence, RI, we queried the institution’s database for children under the age of 18 years who presented during 2014 with positive blood, cerebrospinal fluid, or pleural fluid cultures. We abstracted demographic, clinical, and microbiological information including pneumococcal serotypes from the medical records. The Institutional Review Board of Rhode Island Hospital approved the study.

**RESULTS**

Five previously healthy children without identifiable comorbidities or suspected immunodeficiencies were diagnosed with IPD between October 26 and November 19, 2014 based on culture results. Their cultures were forwarded to the RI DOH (Rhode Island Department of Health) for subsequent serotyping. There were three other pediatric cases of *S. pneumoniae* bacteremia in Rhode Island, in 2014, outside of this cluster: one in January, one in July, and one in the beginning of October. None of those patients’ cultures were serotyped. The patient in January, although fully vaccinated, was immunocompromised and on chemotherapy. The patient that presented in July had received 3 out of 4 PCV-13 vaccines, and had no underlying medical conditions or complications. The patient that presented in the beginning of October was unvaccinated against pneumococcal species, and had three positive blood cultures before clearance was observed.

The average age of patients within this cluster was 3.64 years (0.62–5.58 years). Three patients were male. Four children had previously received appropriate immunizations with PCV-13. Three children were found to have serotype 19A (one of whom was unvaccinated, secondary to parental decision), and one child was found to have serotype 4. Both 19A and 4 are included in PCV-13. The fifth child had serotype 17F, which is not included in PCV-13.

*S. pneumoniae* was isolated from peripheral blood cultures in all cases. Four children presented with pneumonia, confirmed by consolidation on chest X-ray, and one presented with a unilateral infection involving the skin around the eye (preseptal cellulitis).

All five pneumococcal isolates were susceptible to beta-lactams and macrolides. Children with bacteremic pneumonia were treated initially with either ampicillin (n=2) for 1–2 days, followed by amoxicillin for a total course of treatment of 10–14 days, respectively, or ceftriaxone (n=2, one of whom had a non-anaphylactic allergy to penicillin), for 1–2 days, followed by amoxicillin or cefpodoxime for 10–14 days, respectively. The patient with preseptal cellulitis received one dose of ampicillin/subactam followed with standard dose amoxicillin/clavulanate for 10 days.

The patients recovered without complications, except for one child with serotype 4 pneumococcal pneumonia. This child developed empyema after discharge, but was successfully treated with video-assisted thoracoscopy and amoxicillin therapy.

**DISCUSSION**

We report a cluster of IPD among five previously healthy children in Rhode Island who presented in 2014. Four of these children had been appropriately vaccinated with PCV-13, therefore these cases represent breakthrough pneumococcal infections. An increase in the number of invasive pneumococcal infections caused by 19A, and other serotypes not included in PCV-7, has been observed since 2005 in a number of studies.\(^1,3-6\) Only one of our patients had a serotype that was not covered by the vaccine.

The purpose of this report is to raise awareness of possible breakthrough pneumococcal infections despite vaccination with PCV-13 in apparently healthy children.

**References**

Guidelines for Letters to the Editor

Letters to the Editor are considered for publication (subject to editing and peer review) provided they do not contain material that has been submitted or published elsewhere.

The Rhode Island Medical Journal prefers to publish letters that objectively comment on or critically assess previously published articles, offer scholarly opinion or commentary on journal content, or include important announcements or other information relevant to the Journal’s readers.

Letters in reference to a Journal article must not exceed 175 words (excluding references), and must be received within four weeks after publication of the article. Letters not related to a Journal article must not exceed 400 words (excluding references).

A letter can have no more than five references and one figure or table. A letter can be signed by no more than three authors. The principal author will be asked to include a full address, telephone number, fax number, and e-mail address. Financial associations or other possible conflicts of interest must be disclosed.


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