

Burden of *Streptococcus pneumoniae* sepsis in children after introduction of pneumococcal conjugate vaccines - a prospective population-based cohort study

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Background

Population-based studies assessing the impact of pneumococcal conjugate vaccines (PCV) on burden of pneumococcal sepsis in children are lacking. We aimed to assess this burden following introduction of PCV-13 in a nationwide cohort study.

Methods

The Swiss Pediatric Sepsis Study (09/2011-12/2015) prospectively recruited children <17 years of age with blood culture-proven sepsis due to *Streptococcus pneumoniae*, meeting criteria for systemic inflammatory response syndrome. Infection with vaccine serotype in children up to date with PCV immunization was defined as vaccine failure. Main outcomes were admission to pediatric intensive care unit (PICU) and length of hospital stay (LOS).

Results

Children with pneumococcal sepsis (n=117) accounted for a crude incidence of 2.0 per 100,000 children (95% CI 1.7-2.4) and 25% of community-acquired sepsis episodes. Case fatality rate was 8%. 42 (36%) patients required PICU admission. Children with meningitis (29; 25%) were more often infected by serotypes not included in PCV (69% vs 31%; p<0.001). 16 (26%) of 62 children up to date with PCV immunization presented with vaccine failure, including 11 infected with serotype 3. In multivariable analyses, children with meningitis (OR 6.8; 95% C.I 2.4-19.3; p<0.001), or infected with serotype 3 (OR 2.8; 95% C.I 1.1- 7.3; p=0.04) were more often admitted to PICU. Children infected with serotype 3 had longer LOS (coefficient 0.2, 95% CI 0.1-1.1; p=0.01).

Conclusions

The incidence of pneumococcal sepsis in children shortly after introduction of PCV-13 remained substantial. Meningitis mostly due to non-vaccine serotypes and disease caused by serotype 3 represented significant predictors of severity.

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