Pneumococcal Sepsis Risk Remains High in Children After Vaccination

Study results demonstrate the ongoing burden of pneumococcal sepsis among children in Switzerland shortly after the introduction of PCV-13.

The incidence of pneumococcal sepsis in children remained high after the introduction of the pneumococcal conjugate vaccine (PCV)-13 in Switzerland, according to a study published in *Clinical Infectious Diseases*. This study also found that meningitis from non-vaccine serotypes and disease caused specifically by serotype 3 were significant predictors of severity.

Investigators assessed the effect of PCV vaccines on the burden of pneumococcal [**sepsis**](https://www.infectiousdiseaseadvisor.com/sepsis/patients-with-lower-initial-blood-pressure-who-get-iv-fluids-at-lower-sepsis-related-mortality-risk/article/825129/)in children using a nationwide cohort from The Swiss Pediatric Sepsis Study. This cohort recruited children aged <17 years with *Streptococcus pneumoniae* blood culture-positive sepsis who also met the criteria for systemic inflammatory response syndrome between September 2011 and December 2015. Vaccine failure occurred if infection with a vaccine serotype developed in a child with up-to-date PCV immunization.A total of 117 children with pneumococcal sepsis represented a crude incidence of 2.0 per 100,000 children (95% CI, 1.7-2.4) and 25% of community-acquired sepsis episodes. Approximately 25% of children (n=29) found to have [**meningitis**](https://www.infectiousdiseaseadvisor.com/study-protocol-plans-to-examine-liposomal-amphotericin-vs-amphotericin-for-cryptococcal-meningitis/article/826408/)were more often infected by non-vaccine serotypes (69% vs 31%; *P*<.001). Vaccine failure occurred in 16 of 62 children (26%) with up-to-date vaccinations; 11 of these children had infection with *S pneumoniae*serotype 3. The case fatality rate overall was 8%. The multivariable analyses found that children with meningitis (odds ratio [OR] 6.8; 95% CI, 2.4-19.3; *P*<.001) or with serotype 3 infection (OR 2.8; 95% CI, 1.1-7.3; *P*=.04) were more often admitted to the pediatric intensive care unit. The results also found that children with infection from serotype 3 had longer stays in the hospital (β coefficient 0.2, 95% CI, 0.1-1.1; *P*=.01).The study benefited from a population-based design, prospectively collected data such as serotyping and vaccination status, and clearly defined criteria for the inclusion of children with bacteremia and systematic inflammatory response syndrome. This resulted in a population of patients with an unequivocal phenotype. Investigators noted that limitations refer to systematic inflammatory response syndrome-based sepsis definitions that were recently revised in the adult population. In addition, researchers were unable to report on the effect of PCV vaccination on the burden of [**pneumococcal**](https://www.pulmonologyadvisor.com/pneumonia/pneumonia-risk-may-increase-with-benzodiazepine-use/article/829798/)sepsis in Switzerland as a result of a lack of data prior to the vaccine's introduction.

Investigators concluded that this work, “demonstrates the ongoing burden of pneumococcal sepsis among children in Switzerland, shortly after the introduction of PCV-13.” Further, according to investigators, data also supported the need for vaccines that better protect against serotype 3 and ongoing surveillance of invasive pneumococcal disease and sepsis.

**Reference**

Asner SA, Agyeman PKA, Gradoux E, et al. [**Burden of Streptococcus pneumoniae sepsis in children after introduction of pneumococcal conjugate vaccines - a prospective population-based cohort study**](https://academic.oup.com/cid/advance-article-abstract/doi/10.1093/cid/ciy1139/5270128?redirectedFrom=fulltext) [published online January 2, 2019]. *Clin Infect Dis*. doi: 10.1093/cid/ciy1139