

Weak immune system linked to serious bacterial infection in children

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A new study has found a bacterial infection that can lead to pneumonia or meningitis is linked to weakened immune systems in children.

The research suggests invasive [pneumococcal disease](#), especially more than one episode, could be an important marker of a child having an [immune deficiency](#). But delayed diagnosis can cause late specialist referrals and stress for families.

Pneumococcal disease, where bacteria infects a major organ or a person's blood, can lead to serious health problems such as sepsis, pneumonia, meningitis and bloodstream infections.

Despite increasing access to vaccination, pneumococcal disease still causes around 826,000 (11 percent) of deaths globally every year in [children](#) aged under five.

"Even with optimal vaccine coverage, this research shows there is a group of children who are vulnerable to this life-threatening [bacterial infection](#)," study senior author Dr. Amanda Gwee, from the Murdoch Children's Research Institute, says.

Almost 70 percent of children with an immune deficiency had two or more bouts of invasive pneumococcal disease.

Dr. Gwee says to improve early identification of an immune deficiency and prevent further infections, a better understanding of the risk factors for pneumococcal disease are needed.

"Established [risk factors](#) already include [premature birth](#), poor nutrition and HIV infection," she says. "There was an idea that pneumococcal disease may be associated with a weakened [immune system](#), and this study confirms that link."

Lead author Dr. Coen Butters, from The Royal Children's Hospital, says children over two years of age who present with pneumococcal disease should have testing of their immune system.

"There are no guidelines for immune evaluation of these children, which results in significant variation in practice," he says. "There is a risk that these children could be missed, resulting in delayed diagnosis, delayed access to specialist services and more stress for families."

"Early testing enables us to ensure a healthy immune system and where required, offer education and treatment to reduce the very real risk of recurrent infections and death."

The study, published in the September edition of *JAMA Pediatrics*, is the first to systematically examine results from 17 studies of 6022 children, under the age of 18, worldwide. It is also the first since the widespread availability of pneumococcal vaccine.

It found the rate of immune deficiency in healthy children presenting with pneumococcal disease was up to 26.4 percent.

Dr. Butters says the study will inform current clinical guidelines and form the basis for further clinical studies in this area.

He says further studies looking at the predisposing factors for [invasive pneumococcal disease](#) in the era of pneumococcal immunisation are required.

More information: Coen Butters et al. Prevalence of Immunodeficiency in Children With Invasive Pneumococcal Disease in the Pneumococcal Vaccine Era, *JAMA Pediatrics* (2019). [DOI: 10.1001/jamapediatrics.2019.3203](#)

Provided by Murdoch Children's Research Institute (MCRI)

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