

Following maternal transmission, group B strep mutates to sicken infants

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Group B streptococcus, a mostly benign inhabitant of healthy adults, is one of the world's leading causes of neonatal sepsis and meningitis. A team of French investigators has now shown that such cases might occur when the microbe mutates within the infant following transmission from the mother. The research appeared August 17 in the *Journal of Bacteriology*, a publication of the American Society for Microbiology.

In the study, the investigators compared for the first time samples of group B [streptococcus](#) (GBS) from pairs of infected newborns and their mothers. They found that in five out of the 19 sampled newborns, mutations with a potential role in promoting virulence had occurred in GBS.

"The mechanism that encourages these virulence mutations is unknown at present," said Claire Poyart, MD, PHD, Director of the Barriers and Pathogens team at INSERM and the Centre National de Reference des Streptococques, Paris. However, she suggested that the virulence mutations take hold in neonates after their first few days of life, as their immunological defenses develop, applying selective pressure on any group B streptococcus strains that have a fitness advantage.

Some of the virulence-promoting mutations occurred in a gene that can prevent expression of certain group B streptococcus genes, such that when the former malfunctions, [virulence genes](#) are expressed copiously. Another virulence-promoting mutation occurred in the promoter for a highly immunogenic surface protein. By contrast, this mutation caused a

reduction in the expression of the affected gene, which the authors suggest might help the mutated strain evade the host's immune response.

However, these genomic changes were found only in a few cases, as in most of the mother-infant pairs analyzed, group B streptococcus were genetically identical. "In most cases, GBS is just naturally virulent in neonates," said Philippe Glaser, PhD, group leader, Bacterial Genomes and Evolution, at the Institut Pasteur, Paris.

Group B streptococcus is one of the leading causes of [neonatal sepsis](#) and meningitis worldwide. It is a benign inhabitant of the gastrointestinal tract and the genitourinary tract of an estimated 10-30 percent of humans, and a significant cause of disease in the elderly and in immunocompromised adults. The leading cause of early onset GBS infections in infants is thought to be aspiration of GBS-contaminated amniotic or vaginal fluid, leading to pneumonia or sepsis. Later onset cases, which develop after 2-3 weeks, may result in meningitis. A higher number of early onset pairs were studied in this work, but a greater proportion of late onset strains were found to be genetically different.

"There is an urgent need for better therapeutic interventions against neonatal GBS infections," said Poyart.

More information: The full study can be found here:
jb.asm.org/cgi/reprint/JB.0042...f&siteid=asmjournals

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