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COMMENTARY

Refining estimates of neurodevelopmental impairment after group B streptococcal sepsis and meningitis in infancy

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Group B streptococcus (GBS) is one of the leading causes of neonatal sepsis and meningitis. Although mortality is declining, morbidity after infection is common. The study conducted by Mynarek et al.[1] provides valuable insights into the impact of invasive GBS infection on mortality and neurodevelopmental impairment (NDI) in infants born in Norway over a period of 23 years (1996–2019). The study is significant because it sheds light on the long-term consequences of GBS infection in infants up to secondary school age, which, until now, has not been extensively studied. Importantly, the authors used routinely collected data from the Norwegian Surveillance System for Communicable Diseases, the Norwegian Patient Registry, and the Norwegian Cause of Death Registry to identify infants with invasive GBS infection; together, they give a national evolving picture of NDIs in Norway. The study included 230 infants and found that the mortality rate among infants with invasive GBS infection was 10.4%, while the rate of NDIs was 14.3%.

It is vital that we continue to monitor children affected by GBS in early infancy because certain neurodevelopmental and neurological impairments may not manifest themselves until school age. Long-term follow-up is difficult to achieve, even in high-burden settings, but it is vital if the true burden of disease is to be established and to model the impact of a potential maternal vaccine that could reduce the burden of disease considerably. The excess disease burden seen in infants with low-birthweight and infants born preterm, combined with the potential for increased NDIs due to being born too soon, are of great importance as we move towards an investment case for vaccines. Sadly, these two groups were not included in this study; thus, this is a considerable information gap.

In the first global analysis of GBS disease burden, NDI after GBS meningitis identified that 32% (95% confidence interval [CI] = 25–38%) had an NDI at the 18-month follow-up, including 18% (95% CI = 13–22%) with moderate-to-severe NDIs. The review found insufficient data on GBS sepsis for the pooled analysis and highlighted this as a critical gap.[2] In 2021, data on GBS sepsis, a more frequent clinical presentation of this infection compared with GBS meningitis, were published for the first time. A large cohort study in Denmark and the Netherlands showed that GBS sepsis also leads to an increase in NDI risk and special educational needs.[3] These data were incorporated into an international meta-analysis of NDIs after GBS sepsis in five low- and middle-income countries (Argentina, India, Kenya, Mozambique, and South Africa). It estimated that of those children who survived, 20.7% (16.1–25.6%) of those with GBS meningitis (all countries combined), 3.3% (1.0–7.6%) with GBS sepsis in high-income countries, and 9.2% (2.4–22.8%) with GBS sepsis in low- and middle-income countries are predicted to develop moderate or severe NDIs, adding up to 37 100 children (14 600–96 200) annually.[4] A subsequent national study in the UK of 119 infants with GBS sepsis or meningitis found that 40 children (33.6%) had a deficit in 1 or more of the areas assessed, and 37.3% (19/51) of children with meningitis and 30.9% (21/68) with GBS sepsis had NDI ($p = 0.56$). The difference in the proportions of children with meningitis and those with GBS sepsis experiencing subsequent problems was significant for the outcomes of cerebral palsy (11.8% vs 0%) and hydrocephalus (requiring a ventriculoperitoneal shunt) (11.8% vs 0%), which were more frequent in children with meningitis ($p = 0.005$). Finally, this study provided the first information on preterm birth and the double risk of

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GBS disease and NDI. The study found that 60% of infants born preterm had NDI versus 28.3% of infants born at term ($p = 0.009$).[5]

Taken together, these data demonstrate that although the risk of moderate or severe NDIs after GBS sepsis is lower compared with the risk of GBS meningitis in children, the number of moderate or severe NDI cases is probably considerably higher than previously estimated. NDIs after infant GBS disease will deeply affect children's lives, in particular those with moderate or severe impairment, affect their parents, and have economic consequences to society broadly. The findings of this latest study and the systematic review confirm the need to include support and aftercare for those who recover from bacterial meningitis as one of the pillars of the World Health Organization's Defeating Meningitis roadmap and the previously underappreciated group surviving GBS sepsis.[6]

DATA AVAILABILITY STATEMENT

Not required

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