

Future GBS vaccine highly likely to be cost-effective way of preventing infant deaths

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Maternal immunisation. Credit: Brunel University

Bacteria which 1 in 10 pregnant women carry, and which can cause death or serious complications in their babies, could be targeted in a cost-effective way by a future vaccine – even if it costs the NHS as high as £54 a dose.

GBS disease, caused by Group B *Streptococcus*, is responsible for half of all meningitis cases in very young babies, and is a leading cause of sepsis – otherwise known as blood poisoning.

The UK's current GBS prevention strategy involves identifying at-risk expectant mothers and giving them antibiotics during childbirth, but GBS disease – although still rare – is becoming more common. And with several candidate vaccines for pregnant women now in development, health economists have been crunching numbers to see if immunisation could be affordable for the NHS once a vaccine is licensed for use.

Dr. Kyriaki Giorgakoudi, Lecturer in Health Economics at Brunel University London, said: "Group B *Streptococcus* is part of the body's natural flora, and most of us who have it don't experience any adverse effects. But for young babies, GBS can be dangerous.

"GBS disease affects 1 in 1000 babies in the UK, which is nearly 750 babies every year, with more than 1 in 20 of these cases being fatal. Nearly half the survivors of GBS disease will have adverse long-term outcomes, with GBS causing lasting damage to their brain functions."

Modelling health outcomes versus costs

Dr. Giorgakoudi and her colleagues – from the Universities of Cambridge and Birmingham, St George's, University of London, and Public Health England – designed a mathematical model and plugged in everything currently known about GBS disease in the UK, factoring in extensive data about health outcomes and economic costs.

In the study, funded by the Meningitis Research Foundation and published today in the journal *Vaccine*, the researchers used their model to explore different scenarios and identify when maternal immunisation – expected to be used together with the current antibiotic strategy –

would represent value for money.

Taking a conservative view of the benefits of a GBS vaccine, and following the Joint Committee on Vaccination and Immunisation's guidelines on cost-effectiveness studies, the model shows the maximum vaccine price for which maternal immunisation remains cost-effective at £54 per vaccine dose.

"Cost-effectiveness in healthcare is about understanding the best we can do with the currently available financial resources, and how we can allocate these resources to get the most health benefits," Dr. Giorgakoudi said.

"Our study estimates that introducing a GBS vaccine would prevent 369 cases of GBS in infants annually. Twenty-one infant deaths will be averted and 103 maternal disease cases will also be avoided. Considering these benefits in the base case scenario we explored, we have showed that a GBS vaccine would be cost-effective for the NHS up to a maximum price of £54 per dose."

But with GBS disease also implicated in stillbirths, pre-term births and fatal maternal sepsis, adding these into the model, alongside the impact of GBS disease on the health of family members caring for survivors, resulted in an even higher cost-effective vaccine price of £107.

Immunisation "the best way to save lives"

The excellent prospect of a vaccine reducing the burden on GBS disease is encouraging news for key organisations for whom neonatal meningitis reduction is an international priority, including the Meningitis Research Foundation.

Linda Glennie, Director of Research at Meningitis Research Foundation,

said "Screening pregnant women for GBS is not routine in many countries, and while guidance exists to identify at-risk expectant mothers, it is not consistently delivered and cannot prevent all cases.

"GBS is still rising in the UK and beyond. Preventing GBS by vaccinating pregnant women would be the best way to save lives. We are delighted that the findings from this research could help speed up introduction of a vaccine once it is licenced to protect pregnant women and their newborn babies from GBS."

Dr. Giorgakoudi added: "We don't know exactly how many years in the future a vaccine will be ready to roll out.

"But when it is, a maternal immunisation strategy in combination with the current antibiotic strategy is highly likely to be a cost-effective intervention against infant GBS [disease](#) for the NHS, assuming the [vaccine](#) is safe, effective, and can be purchased and administered at a reasonable price."

More information: Kyriaki Giorgakoudi et al. Cost-effectiveness analysis of maternal immunisation against group B Streptococcus (GBS) disease: A modelling study, *Vaccine* (2018). [DOI: 10.1016/j.vaccine.2018.09.058](#)

Provided by Brunel University

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