

Infant vaccination schedule leads to significant fall in meningitis B

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THE INFANT VACCINATION PROGRAMME AGAINST MENINGITIS B INTRODUCED IN THE UK IN 2015

has been highly effective, a study from Public Health England has confirmed. The findings were published in the *New England Journal of Medicine* in January.¹

In the UK, the vaccine 4CMenB is given at 8 and 16 weeks of age with a booster at 12 months. Armed with information on the number and serotype of infections, together with data on vaccine uptake, the research team evaluated the effect of infant vaccination on the incidence of meningococcal group B disease during the first three years of the programme from September 2015 to August 2018.

The observed incidence of meningococcal group B disease was compared with the expected incidence based on the incidence figures for the four-year period before the vaccine was introduced in equivalent cohorts and with the use of disease trends in cohorts of children younger than five years of age who were not eligible to receive the vaccine. Vaccine effectiveness was estimated with the use of the indirect screening method.

Data from the first three months of 2018 showed that 92.5% of children in England (average annual birth cohort, approximately 650,000 infants) had completed the primary immunisations by their first birthday and 87.9% had received all three doses by two years.

These high uptake rates led to a significant fall in the expected number of cases, in all there were 63 observed cases compared with 253 expected cases; incidence rate ratio 0.25 (95% CI: 0.19-0.36), a 75% reduction in age groups that were fully eligible for vaccination.

The adjusted vaccine effectiveness for a single dose of 4CMenB was 24.1% according to data on 74 children with disease (16 children who had not received the vaccine and 58 who had received just one dose).

Of the children with an onset of meningococcal group B disease between 133 days and 13 months of age, four were unvaccinated and 37 had received two doses of 4CMenB. Thus, the adjusted vaccine effectiveness was 52.7% with a two-dose priming schedule. In this group, 26 children had disease that was confirmed by culture and, of these, 16 (62%) had MATS-positive disease. The Meningococcal Antigen Typing System (MATS) predicts strain coverage by

4CMenB-induced antibodies. Assuming that only the MATS-positive strains were preventable by 4CMenB, the estimated vaccine effectiveness against vaccine-preventable meningococcal group B strains among children who received two doses was 64.4%.

The adjusted vaccine effectiveness was 59.1% for children who had received three doses i.e. a two-dose priming schedule plus a booster at 12 months.

Over the first three years of the vaccination programme there were 169 cases of meningococcal group B disease in the vaccine eligible cohorts and an estimated 277 cases were prevented.

Children who had the booster at 12 months had onward protection for a further two years.

Interestingly, even though the UK had implemented a reduced dosing schedule (three instead of four doses of vaccine)

the vaccine was still effective.

Meningococcal group B is responsible for most cases of childhood meningococcal disease in Europe. Meningococcal disease is a condition that all GPs dread to encounter. It can affect all age groups, but the highest rates of disease are in young children, with the peak incidence in those under one year.

The study authors conclude: 'This study provides real world evidence of the effectiveness of 4CMenB in preventing invasive meningococcal group B disease three years after its introduction into the UK national infant immunisation programme.

'We found that the 12-month booster protected against meningococcal group B disease for at least two years. This is particularly important because the highest burden of meningococcal group B disease in England occurs during the first three years of life.'

'There was a 75% reduction in cases of meningitis B in age groups that were fully eligible for vaccination'

REFERENCE

¹ Ladhani SN, Andrews N, Parikh SR et al. Vaccination of infants with meningococcal group B vaccine (4CMenB) in England. *N Engl J Med* 2020;382:309-17

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