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Meningitis vaccine could protect against gonorrhoea, studies find

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The meningitis vaccine could be used to provide some protection against gonorrhoea, researchers have said.

In a collection of studies published in *Lancet Infectious Diseases* they reported that two doses of the 4CMenB vaccine were around 33% to 40% effective against gonorrhoea in adolescents and young adults. A separate modelling study indicated that vaccinating the people most at risk could prevent 110 000 gonorrhoea cases in England and save the NHS £8m (€9.7m; \$10.4m) over 10 years.

No vaccine for gonorrhoea currently exists, and growing resistance to antibiotics has led to treatments becoming less effective. More than 80 million new cases of gonorrhoea were recorded worldwide in 2020.

In the first observational study,¹ researchers used health records to identify confirmed cases of gonorrhoea and chlamydia among 16-23 year olds in New York City and Philadelphia between 2016 and 2018. These were then matched to immunisation records.

The team found more than 167 000 infections (18 099 gonorrhoea, 124 876 chlamydia, and 24 731 coinfections) in almost 110 000 people. Of these, 7692 people had received the 4CMenB vaccine, (52% one dose, 47% two doses, and less than 1% more than two doses). By comparing the prevalence of gonorrhoea during vaccinated periods with the prevalence during unvaccinated periods, the authors estimated that two doses of the 4CMenB vaccination provided 40% protection against gonorrhoea, while one dose provided 26% protection.

Study lead Winston Abara, from the US Centers for Disease Control and Prevention's division of sexually transmitted diseases prevention, said, "Our findings suggest that meningitis vaccines that are even only moderately effective at protecting against gonorrhoea could have a major impact on prevention and control of the disease."

In the second observational study, researchers from the Women's and Children's Hospital, Adelaide, and the University of Adelaide analysed 4CMenB vaccination in South Australia. They found that more than 53 000 adolescents and young adults had received at least one dose of 4CMenB during the programme's first two years.² Using patients with chlamydia as a control, because of the similar sexual behavioural risks, the researchers estimated that, as well as being highly effective against meningococcal B meningitis and sepsis, two doses of 4CMenB were 33% effective against gonorrhoea in adolescents and young adults.

Real world impact

The third study modelled the health and economic effects of using the 4CMenB vaccine to protect against gonorrhoea.³ The researchers compared three realistic

vaccination approaches among men who have sex with men (MSM) in England: vaccination of all men attending sexual health clinics, vaccination after a confirmed gonorrhoea diagnosis, and vaccination based on risk of infection. After balancing cases prevented with cost of vaccination, the team recommended 4CMenB vaccination of men who have sex with men at highest risk of gonorrhoea infection, a move they said could prevent an estimated 110 000 cases and save £8m over 10 years.

Lead author Peter White, professor of public health modelling at Imperial College London, said, "With a gonorrhoea-specific vaccine likely to take years to develop, a key question for policymakers is whether the meningitis vaccine 4CMenB should be used against gonorrhoea infection. Our analysis suggests that giving the vaccine to those at the greatest risk of infection is the most cost effective way to avert large numbers of cases."

- 1 Abara WE, Bernstein KT, Lewis FMT, et al. Effectiveness of a serogroup B outer membrane vesicle meningococcal vaccine against gonorrhoea: a retrospective observational study. *Lancet Infect Dis* 2022;S1473-3099(21)00812-4. doi: 10.1016/S1473-3099(21)00812-4. pmid: 35427490
- 2 Wang B, Giles L, Andraweera P, et al. Effectiveness and impact of the 4CMenB vaccine against invasive serogroup B meningococcal disease and gonorrhoea in an infant, child, and adolescent programme: an observational cohort and case-control study. *Lancet Infect Dis* 2022;S1473-3099(21)00754-4. doi: 10.1016/S1473-3099(21)00754-4.
- 3 Whittles LK, Didelot X, White PJ. Public health impact and cost-effectiveness of gonorrhoea vaccination: an integrated transmission-dynamic health-economic modelling analysis. *Lancet Infect Dis* 2022;S1473-3099(21)00744-1. doi: 10.1016/S1473-3099(21)00744-1. pmid: 35427491