



Risk of antibiotic resistant meningococcal infections in Hajj pilgrims

Have a high index of suspicion if people fall ill on returning home

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On 22 July Public Health England issued an important public health announcement—the unusual occurrence in the UK of three people with non-groupable meningococcal infections connected with recent travel to Mecca, Saudi Arabia.¹ Two presented with conjunctivitis just days after returning from a pilgrimage. The third person, who was a close contact of one case but had not travelled to Mecca, developed invasive meningococcal disease. *Neisseria meningitidis* isolates from all three individuals had the same phenotype (NG;NT;P1.15); they were resistant to ciprofloxacin and had only intermediate susceptibility to penicillin. Meningococcal conjunctivitis is known to carry a high risk of invasive disease¹⁻³ and requires immediate treatment, along with antibiotic prophylaxis for close contacts.

Ciprofloxacin is the recommended chemoprophylaxis in both the UK and Saudi Arabia. The identification of resistant meningococcal conjunctivitis in people returning from Mecca, highlights the urgent need to review currently recommended prophylactic measures for Hajj pilgrims, how best to prevent spread of *N meningitidis* between people attending mass gatherings, and how to protect contacts on return.⁴⁻⁶

Over 2.2 million pilgrims (25 000 from the UK) travelled from over 180 countries to Mecca, Saudi Arabia, for the 2019 Hajj pilgrimage, which took place from 9 August to 14 August. Pilgrims will make their way home over the next few weeks, and health services in destination countries need to be on heightened alert for imported pathogens with epidemic potential, including ciprofloxacin resistant *N meningitidis*.⁶ Continued global surveillance for meningococcal disease and antibiotic resistance, along with both epidemiological and molecular research are essential to improve case detection, predict trends, and inform evolving prevention and control strategies.⁵

Prevention challenges

The annual Hajj pilgrimage has been associated with repeated outbreaks of invasive meningococcal disease. The largest occurred in 1974 (2673 cases), 1988 (1618 cases), 2000 (338 cases), and 2001 (316 cases).⁷ Since 2001 the Saudi authorities

have strictly enforced a visa requirement for pilgrims, mandating vaccination with a single dose quadrivalent meningococcal vaccine (A,C,W-135, and Y). Adherence is 98% and no further major outbreaks have occurred.⁸

However, meningococcal disease remains a priority public health threat at the Hajj because of the evolving nature of invasive disease, emergence of antibiotic resistance, diverse and varying geographical trends in serotypes other than A, C, W-135, and Y, fluctuations in incidence, and shifts in serogroups and genotypes which may increase epidemic potential.⁵

Every year, the Saudi Ministry of Health updates immunisation and antibiotic prophylaxis requirements for pilgrims, and meningococcal vaccination remains compulsory.⁸ However, concerns have been raised about vaccine availability, and it has been suggested that adherence might have been compromised among pilgrims attending the 2019 Hajj.⁹ Furthermore, even vaccinated pilgrims remain susceptible to disease caused by serogroups B and X, which are not covered by the quadrivalent vaccine.¹⁰

The high risk of meningococcal meningitis outbreaks, increasing incidence of serogroup B disease, and emergence of serogroup X in the African meningitis belt,⁵ from which a large number of pilgrims originate, is of particular concern. The Saudi Ministry of Health therefore mandates ciprofloxacin prophylaxis for pilgrims from meningitis belt countries.⁸ Over the past decade, 1.5 million doses of prophylactic ciprofloxacin have been administered to pilgrims at port of entry, and this has probably contributed to the emergence of ciprofloxacin resistant *N meningitidis*.¹¹

Authors of a recent large study of Hajj pilgrims⁵ recommended reconsidering use of ciprofloxacin for prophylaxis and including serogroup B vaccines in pre-travel requirements since more than 60% of *N meningitidis* isolates from participants were B type. The current preventive measures for Hajj and other mass gatherings¹² require urgent review and should be regularly updated in accordance with changes in the epidemiology of

meningococcal disease, including resistance, and the availability of new vaccines.

Meanwhile, as the 2.5 million pilgrims from the 2019 Hajj return home and an expected 7 million pilgrims travel to Saudi Arabia for the Umrah mini pilgrimage over the next 12 months, questions remain about how best to protect them and their contacts from meningococcal disease. There is no room for complacency. Measures should include proactive clinical surveillance, education of first contact health professionals on the importance of taking a travel history, and a high index of suspicion for meningococcal infection among pilgrims who become ill on return. Public Health England has alerted NHS professionals of this need and provided management guidelines.¹³ Health authorities should do the same in all 180 home countries for Hajj pilgrims.

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