

A SECONDARY CASE OF MENINGOCOCCAL DISEASE IN AN AMBULANCE WORKER, BERKSHIRE, NOVEMBER 2007

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Secondary cases of meningococcal disease among healthcare workers are rare and avoidable. In this report, we describe a secondary infection in a healthcare worker who did not have significant contact with respiratory secretions of the index case.

Case report

In mid-November 2007, a paramedic crew attended a house call to a drowsy and agitated patient suspected to have meningococcal meningitis. One of the two ambulance crew members, a technician in her thirties, managed the head end of the patient, assisted in transferring her to a chair and down the stairs into the ambulance.

Whilst in the ambulance, the technician remained at the patient's head end placing an oxygen face mask which the patient repeatedly attempted to remove during the journey. The ambulance technician was not wearing a mask at the time. The patient did not cough or splutter and suction was not used. The patient did not require intubation or any airway adjuncts during transfer to the local hospital. On arrival to the hospital, the ambulance technician assisted in transferring the patient to the emergency department. The total contact time between the patient and the ambulance technician was approximately 40 minutes. There was no history suggestive of direct exposure of the ambulance technician to large particle droplets/secretions from the patient.

On notification of suspected meningococcal disease to the Thames Valley Health Protection Unit, close contacts of the index case were identified and chemoprophylaxis was given based on national guidance [1]. The ambulance staff involved did not fulfil the criteria for close contacts and therefore were not offered chemoprophylaxis. PCR of cerebrospinal fluid in the index case subsequently confirmed *Neisseria meningitidis*.

Four days after the event, the ambulance technician developed symptoms of malaise, cough, sore throat and fever. Symptoms of headache and neck stiffness ensued a day later leading to admission to hospital the following day. She had no history of immunosuppression. As meningococcal infection was suspected, empirical treatment was started with antibiotics. Blood cultures grew *N. meningitidis* after two days of incubation. PCR of the cultured organism identified meningococcus serogroup B with the DNA sequence VR1(17); VR2(23); VR3(37), identical to the sequence seen in the PCR from cerebrospinal fluid of the index case. The history of exposure, time correlation to development of symptoms and DNA sequencing results strongly suggest that the ambulance worker contracted the infection from the index case. Both cases made an uneventful recovery. The other ambulance crew member who attended the original call have remained asymptomatic and well.

Discussion

To the best of our knowledge, this is the first reported secondary case of meningococcal disease in a healthcare worker, who did not have significant contact with respiratory secretions of the index case. A retrospective study of the risk in healthcare workers in England and Wales identified three probable cases of secondary meningococcal infections in healthcare workers over a fifteen year period [2]. Previous reports describe significant contact with respiratory secretions such as mouth to mouth resuscitation, intubation or patient coughing/spluttering during airway management. Despite the twenty-five-fold increased relative risk of infection in healthcare workers compared to general population, the absolute risk remains extremely low (0.8/105). It is estimated that 144,000 healthcare worker contacts would need to receive chemoprophylaxis in order to prevent one case [2,3].

Current guidelines in the United Kingdom on chemoprophylaxis for healthcare workers state that it is recommended only for those not wearing masks or other mechanical protection, whose mouth or nose is directly exposed to infectious respiratory droplets/secretions within a distance of three feet (90 cm) from a probable or confirmed case of meningococcal disease [3]. This degree of exposure is unlikely to occur unless using suction, inserting an airway adjunct, intubation, or if the patient coughs during airway management. For prevention of secondary disease in healthcare workers, the use of surgical masks is encouraged to reduce the risk of exposure. Similarly, in the USA, healthcare workers are recommended to wear surgical masks when working within three feet (90 cm) of patients known, or suspected to be infected with micro-organisms transmitted by large-particle droplets (>5 micrometres diameter) [4]. This recommendation is based on laboratory evidence that surgical masks can protect the wearer against droplet transmission [5,6].

Indiscriminate use of chemoprophylaxis can lead to potentially serious complications such as antibiotic related adverse reactions, development of resistance and elimination of non-pathogenic *Neisseria* species leading to reduced immunity against pathogenic species and therefore higher likelihood of invasive disease [7,8].

Conclusion

The transmission of meningococcal meningitis in the manner described in this case is extremely rare; therefore extending chemoprophylaxis to all healthcare workers involved in the initial management is not justifiable. In light of this case report, we believe it is prudent to recommend the use of surgical masks by healthcare workers, especially paramedics, during the management of patients with suspected meningococcal infection.

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