

An outbreak of meningococcal disease in a secondary school — implications for public health practice

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Abstract

This report describes briefly the management of three cases of meningococcal disease which all occurred within one week at a secondary school on the Central Coast of New South Wales in late winter 2003. The Central Coast health area has a population of approximately 300,000. Between 10 and 15 cases of meningococcal disease are notified to the Central Coast Public Health Unit each year. The three cases all presented to Gosford Hospital, Cases 1 and 2, both in Year 9, on Thursday 14 August 2003 and Case 3 in Year 8 on Friday 15 August 2003. *Commun Dis Intell* 2004; 28:345–347.

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Cases 1 and 2

On admission, Case 1 was diagnosed with meningococcal disease, intubated and admitted to the Intensive Care Unit (ICU). The initial diagnosis for Case 2 was gastroenteritis but this was changed to meningococcal infection after about six hours and the patient was also admitted to the ICU. In both cases prophylaxis (rifampicin) was given to family members and close contacts. On Thursday, after discussion with several experts, it was decided to offer prophylaxis (rifampicin or ciprofloxacin) to all 220 Year 9 students on the following day.

A response team spent part of Thursday evening and Friday morning preparing a response strategy specific to the given conditions. The main concern was that the team had a very short window of opportunity, limited to Friday only, and during school hours. Since the decision to offer prophylaxis was made after school hours on Thursday, the usual practice of sending consent forms home with the students could not occur. Therefore part of Friday morning was spent telephoning parents of all Year 9 students to obtain consent for the prophylaxis, and thus further limiting time available with the students.

Before lunch on Friday, the Director (Medical Officer of Health) of the Central Coast Public Health Unit (PHU) spoke to all Year 9 students in a single group. He briefly outlined our understanding of meningococcal disease, how it is thought to be spread, the current situation with two Year 9 students in hospital, and the rationale for recommending antibiotic prophylaxis for students in Year 9. He had parental consent to give a progress report on the two cases, both of whom were stable. The risk of further cases occurring was described, and it was emphasised that family and household contacts of the cases had a much greater risk than Year 9 students, who in turn had a higher risk than the general community. Students were mainly concerned about possible side effects of the medication and these were explained. The procedure for prescribing the antibiotics was also explained. This session was delivered in an informal style with questions answered as they arose, and lasted about 40 minutes.

Medication of students on Friday could only begin at about 1400 hours and was scheduled to stop at approximately 1500 hours to allow many of the students to catch buses home. More delays occurred during the dispensing process when team staff were asked about rifampicin interactions with

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methylphenidate (ritalin), a drug not specifically mentioned in the national guidelines.¹ These circumstances created some pressure on the team to maintain a steady throughput of students. However, with arrangements made to delay bus departures briefly, 202 of 220 students were able to receive prophylaxis.

The PHU Director returned to the school on the following Monday to dispense chemoprophylaxis to the remaining students who were absent on Friday. Hence 215 out of 220 students received medication. Of the remaining five, three were the cases, one had left school and one was in the process of leaving and declined treatment.

Meningococcal disease type C was confirmed by polymerase chain reaction (PCR) during the week following initial diagnosis.

Case 3

On presentation, Case 3 was also diagnosed with gastroenteritis. Because this patient was a student at the same school as Cases 1 and 2, and presented soon after they did, blood was taken to exclude meningococcal disease and intramuscular penicillin was given. This case was discharged from the Emergency Department on 16 August 2003. When meningococcal infection was confirmed by PCR on 19 August, Case 3 was recalled for ambulatory intravenous antibiotics and prophylaxis was given to family members and close contacts.

Confirmation of a third case of meningococcal infection prompted a decision to offer meningococcal C vaccine to all students at the high school. This decision simply accelerated the National Meningococcal C Vaccination Program scheduled for years 10, 11 and 12 at the school and expanded it to years 7, 8 and 9. All three cases recovered completely and no new cases have been reported following the completion of the vaccination program.

Implications for Public Health Practice

A review of the outbreak by staff of the PHU suggested that local adaptations, specific for a given situation, are needed to expand the national guidelines.¹ Such adaptations could refer to some or all of the following response processes.

PCR diagnosis

Case 3 was sent home with a provisional diagnosis of gastroenteritis. Without PCR testing for meningococcal disease, Case 3 would not have been identified. PCR tests to detect meningococcal DNA have high sensitivity and specificity. They are being used in clinical situations where meningococcal dis-

ease is suspected and blood or other cultures are negative. They are also being considered in patients with less obvious symptoms, particularly when the disease is present in the local community. This does raise some questions. Do protocols need revision in light of our increased ability to detect milder disease? Will greater recognition of milder disease escalate the public health response? This would seem likely. Will there be a better health outcome? It will be important to monitor the impact of PCR testing and the subsequent public health response.

Time constraints

Our experience indicates that it is important to determine how long the target group will be available to the response team. In this outbreak, the students were available only during school hours, excluding lunchtime. In preschools this time could be significantly shorter. Getting information and consent forms home to parents the day before the medication is to be dispensed can save hours spent telephoning parents on the clinic day.

Staffing needs

While a response team can usually be assembled easily, the response could have been streamlined by appointing an event coordinator, preferably a senior health professional with emergency management experience. In addition, sufficient staff should remain at the office to ensure other public health needs are adequately met. A person whose sole role is managing media inquiries is also desirable.

Medication needs

Arrangements need to be in place to provide adequate quantities of medication at short notice. Notifying the pharmacy early to the possibility of a mass prophylaxis event, even before a decision is made, has proved to be useful in our experience. There was no delay in providing medication in this outbreak due to the immediate and willing cooperation by pharmacy staff. However, one of the authors (TM) has experienced delay in the provision of medication while managing other outbreaks.

Fact finding and information sharing

Our experience has emphasised the need for the local public health unit to regularly share information with all stakeholders throughout the investigation. This improves cooperation and streamlines the investigation.

Reducing concern in the affected population

It is important to minimise concern in the affected population by appropriate and timely information. While the time taken to telephone parents was considerable, it did allow an opportunity to respond to any questions or concerns.

Conclusion

The national guidelines¹ state that 'A structured review should always be undertaken of each outbreak and its management with a view to improving performance' (p. 31). As the practical realisation of such advice, this report indicates that recorded experience in the management of an outbreak of meningococcal disease is likely to pay dividends in the management of future outbreaks.

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References

1. Communicable Diseases Network Australia. Guidelines for the Early Clinical and Public Health Management of Meningococcal Disease in Australia. Commonwealth Department of Health and Aged Care, Canberra: June 2001.