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Measles in health care facilities: some salutary lessons

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Measles transmission occurs readily in health care facilities such as general practices and hospitals. It can not only lead to measles in other patients at the facilities but also to measles in medical and nursing staff. In the recent (1999) measles outbreak in Victoria, four of the 62 cases were health care workers.¹ A further obvious concern in health care facilities is that those exposed may include immunocompromised patients or very young children, two groups in whom measles can be very severe.

The reasons for the ready transmission are:

- many patients with measles present to GPs and hospitals for diagnosis and management,
- patients with measles are highly infectious; the infectious period extends from 5 days before the appearance of the rash until 4 days after the onset of rash;
- many younger doctors have never seen measles;
- many doctors are not aware of the need for a prompt public health response and do not notify a case of measles until it has been confirmed by a laboratory; and
- the lack of clear vaccination policies for health care providers.

A recent outbreak of measles in north Queensland highlighted some of the above issues, and provides useful lessons for the future.

The outbreak

Five children, all from the same north Queensland family, were confirmed as having measles on Monday 15 May. Not one of the children, whose ages ranged from 2.8 to 11.5 years, had been vaccinated.

Two of the children, a boy and a girl, had travelled to the United Kingdom in early April on an evangelical tour. En route they stayed overnight in a hotel in Colombo, Sri Lanka. The tour included 10 nights in Scotland, 7 in England and 2 in Wales. The children on the tour stayed, as billets, in private homes.

The boy (9.3 years) first became unwell in England in mid-April, 12 days after leaving Sri Lanka. The rash appeared three days later on Good Friday (21 April) while in England. He was seen by two GPs that day and although both made a clinical diagnosis of measles neither requested any tests and neither gave any specific advice (about isolation and other precautions) to the adults caring for the boy on the tour.

There were 8 children (aged 9-16 years) and 5 adults in the Australian party on the tour. Apart from the north Queensland children, all the remainder of the party remained well.

(Incidentally, the church involved is not anti-vaccination; it was a parental decision, not based on a religious belief, not to have the children vaccinated).

An English teenager, who was in contact with the north Queensland boy in mid-April, became unwell at about the end of the month. He had fever, vomiting, sore throat, cough and a 'very red rash'. He was diagnosed by a GP as having scarlet fever and was prescribed antibiotics.

The tour party returned to Australia in late April. The boy was by then well but on the day of arrival back in their home city in north Queensland the girl (11.5 years) was noted by her parents to be unwell. She was taken to a local medical centre where the contact with measles was elicited at the consultation, 'fever and malaise' noted, and a diagnosis of possible measles made. The child was seen again at the medical centre two days later. A florid rash appeared the next day (3 May) and a clinical diagnosis of measles was made on 5 May at her third visit to the centre. No diagnostic tests were ordered, no specific instructions were given to the family and the clinical diagnosis was not notified.

All three younger siblings (2.8, 5.75 and 7.6 years) became unwell about 8-9 May. On the weekend on 6-7 May the family travelled from their home city to another north Queensland city, where they stayed at a caravan park, and back.

On 10 May the father and two boys (the boy infected while overseas and the 5.75 year old, the latter of whom was unwell) again travelled to the other city. En route the three stayed in a small rural town. The ill boy was seen on the evening of 12 May by a GP in the town. The boy developed a rash the next day (13 May). He presented that evening to the emergency department of the city's public hospital and was admitted to an isolation bay 5 hours later. He was notified to the Tropical Public Health Unit (TPHU) 36 hours after being admitted; his measles IgM was positive. Subsequent studies done on PCR-positive throat swabs that had been collected from all four children who became unwell in Australia showed that the infecting measles virus was the 'Sri Lankan genotype' (personal communication, Dr Heath Kelly, Victorian Infectious Diseases Reference Laboratory, North Melbourne, Victoria).

Meanwhile the youngest sibling had been seen at the medical centre in her home city on 14 May. A clinical diagnosis of measles was made, but again the consulting doctor failed to request diagnostic tests, to give her mother specific instructions (eg. about keeping the child in isolation) and to notify the clinical diagnosis.

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Fortunately not one of the five children attended either day-care or school during their infectious periods, and their mother has tended to keep them at home for much of this time. Nevertheless, they had had a few visitors and had on occasion been locally out of the house.

Within 24 hours of receiving the notification, the TPHU requested the two medical practices and the public hospital to identify, as a matter of urgency, all those who were in the practices and emergency department from one hour before until two hours after the measles cases were seen. (The measles virus remains viable in the environment for up to 2 hours). Each individual had to be assessed to determine whether they were susceptible to measles; children 1-4 years with one documented dose of MMR, those over 4 or born during or after 1970 with two documented doses of MMR, and those born before 1970 are considered to be immune ie. not susceptible.²

Susceptible persons over 9 months of age were to be offered an immediate dose of MMR if it was less than 3 days after the exposure to measles at the health care facility, otherwise if 3-7 days post-exposure they were to be offered immunoglobulin. Clearly not only was this exercise extremely demanding in the city general practice and in the hospital, but also it could not 'capture' every person who had been exposed. At the public hospital for example, over 80 people had to be contacted (including staff, patients, those accompanying the patients etc) and 29 doses of MMR and one dose of immunoglobulin were given. With one exception, all those requiring MMR or immunoglobulin were susceptible 20-29 year olds.

Other GPs in the two cities were informed, via the Divisions, about the outbreak as were other local emergency departments. They were asked to ensure that any possible measles case be promptly triaged and not left in waiting rooms, to request measles IgM serology (even if the patient was a young child) and to immediately notify TPHU (without waiting for results to become available).

Meanwhile, TPHU had to undertake contact tracing elsewhere in the two cities (eg. at the caravan park) and in the rural town. This contact tracing, and arranging for susceptible contacts to be given either MMR or immunoglobulin required the commitment of five TPHU personnel (physicians, nurses, indigenous public health worker) full-time for about seven days.

Over the next three weeks 7 possible cases of measles were notified to TPHU; one was indeed a case (imported from Malaysia, and not related to the local outbreak) but the remaining six were eventually proven not to be measles. The outbreak was declared over three weeks after the onset of the last child in the family.

Lessons learned

A history of close contact with a measles case, especially in an unvaccinated person, must make health care providers consider measles as a likely diagnosis in an unwell patient with a fever.

A history of overseas travel must make health care providers consider measles as a possible diagnosis in a patient with a febrile illness and a morbilliform rash. Measles still in widespread circulation in many countries; Sri Lanka, the Netherlands and East Timor have had recent large outbreaks.

Health care providers should always notify a case of measles upon clinical suspicion. This enables TPHU to recommend to the provider the most appropriate tests, and to make recommendations about necessary interventions, exclusions etc.

Health care providers must be aware that their facilities can serve as effective sites for measles transmission, and can precipitate or aggravate measles transmission in the community. A prompt notification from the general practice on 5 May (10 days before the date of the actual notification) would have saved the practice (and probably the other practice and the hospital) a lot of unnecessary work.

Health care providers have a duty-of-care to ensure that they do not put patients at unnecessary risk. Therefore they are obliged to recall patients, to assess their susceptibility and to provide either MMR or immunoglobulin in an attempt to abort any incubating measles infection inadvertently acquired at their facilities.

A verbal history of prior doses of MMR, (or of prior measles), is very unreliable, particularly in adolescents and young adults. We know of two circumstances in this outbreak where a verbal history was shown to be incorrect. Attempts must be made to obtain documentation of prior vaccination; if proof is not available, a person should be considered to be susceptible and managed accordingly.

TPHU learned just how valuable PCR tests can be, particularly early in the illness before measles IgM antibodies have developed. Throat swabs were PCR-positive in four, and urine PCR-positive in two, of the children. This enabled genotyping to be performed.

Finally, TPHU once again learned just how important Divisions are for the rapid dissemination of information to local GPs.

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