Measles

Epidemiology in New Zealand

New Zealand has continued to experience outbreaks of measles in recent decades. This is due to historically low immunisation rates and therefore insufficient levels of immunity across the population to prevent community transmission.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz.

Case definition

Clinical description

An illness characterised by **all** of the following:

1. generalised maculopapular rash, starting on the head and neck
2. fever (at least 38°C if measured) present at the time of rash onset
3. cough or coryza or conjunctivitis or Koplik's spots present at the time of rash onset.

Laboratory test for diagnosis

If the case **received a vaccine** containing the measles virus in the 6 weeks prior to symptom onset then **laboratory confirmation requires**:

- evidence of infection with a wild-type virus strain obtained through genetic characterisation.

If the case **did not receive a vaccine** containing the measles virus in the 6 weeks prior to symptom onset, then **laboratory confirmation requires** at least one of the following:

- detection of IgM antibody specific to the virus
- IgG seroconversion or a significant rise (four-fold or greater) in antibody level for the virus between paired sera tested in parallel where the convalescent serum was collected 10 to 14 days after the acute serum
- isolation of measles virus by culture
- detection of measles virus nucleic acid.

It is strongly recommended that, for any sporadic cases of suspected measles, two or more samples be taken: preferably blood for serology, and nasopharyngeal swab or

urine sample for nucleic acid testing (NAT). The use of laboratory tests may change in an established outbreak. Genetic characterisation should be carried out in accordance with advice from the national measles laboratory, in particular for imported cases, for sporadic cases unrelated to a known outbreak, and during the course of a prolonged outbreak for cases without clear epidemiological links to previously confirmed cases.

Interpreting serology

Measles IgG detected within 1–2 days of a rash and no measles IgM strongly suggests prior immunity and that the rash is more likely due to causes other than measles.

After measles vaccination, measles IgM is produced as part of the seroconversion and can be detected for 1–2 months. Serologically diagnosed cases who have received a measles-containing vaccine 8 days to 6 weeks before testing should not be classified as confirmed measles cases unless they are also linked epidemiologically to another confirmed case before vaccination. Measles virus genetic characterisation can distinguish between vaccine and wild-type strains.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed or epidemiologically linked to a confirmed case.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Spread of infection

Incubation period

About 10 days, but may be 7–18 days from exposure to onset of fever. The incubation period may be longer in those given immunoglobulin after exposure.

Mode of transmission

Airborne spread or by direct contact with nasal or throat secretions of cases. The virus can persist in the environment for up to 2 hours.

Period of communicability

For public health purposes, this can usually be considered from 5 days before to 5 days after rash onset, counting the day of rash onset as day 1.

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Management of case

Investigation

Wherever possible, all relevant clinical and demographic information on the suspected case should be collected within 1 working day.

Obtain a history of vaccination, immunodeficiency, contact with a probable or confirmed case and travel.

In consultation with the attending medical practitioner, obtain laboratory confirmation where possible and necessary. Testing may not be necessary or appropriate for cases with an epidemiological link to a confirmed case, or in outbreak situations.

Restriction

In health care facilities, airborne precautions should be taken until 5 days after the appearance of the rash.

Exclude from early childhood service, school or work and close contact with unexposed people for at least 5 days after the appearance of the rash.

Treatment (supportive)

Vitamin A treatment in hospital at the time of measles infection can reduce the risk of fatality and eye complications and should be considered particularly in cases with severe or complicated measles, immunodeficiency, malabsorption, malnutrition or documented vitamin A deficiency.

Counselling

Advise the case and their caregivers of the nature of the infection and its mode of transmission. If other vaccinations are incomplete, recommend the case catches up once they are through the acute illness.

Active case finding

Public health units should alert doctors and laboratories in areas where the case may have acquired the infection or was infectious and should ask these doctors and laboratories to notify all cases to the public health unit promptly. Part of the reason for this is that early prophylaxis given to susceptible contacts (see below) can reduce the risk of developing disease. Consider a media alert to assist in finding cases.

Management of contacts

Definitions

Contact

Any person who has been in a confined space with the case during the period of communicability. Confined settings may include an early childhood service, classroom, household, transportation, indoor occupational or social setting. Some judgement may be required by the local medical officer of health, but noting that measles is highly infectious and this should be taken into account when determining contacts and public health action.

Any person who has been in a waiting or consultation room with an infectious case, or has spent time in that room up to and including 2 hours after it has been vacated by the case must be treated as a contact.

Susceptible contact

- Anyone born from 1 January 1969[1] who has not had measles infection or has not been fully vaccinated for their age.
- Anyone born between 1969 and 1981 who only received a single dose of measles vaccine between the ages of 10 and 15 months (because of possible interference from the mother's antibodies).

Acceptable presumptive evidence of immunity

- Date of birth before 1 January 1969 (they are presumed to be immune following exposure to the wild virus).
- Documentation of immunity or previous infection.
- Documentation of two doses of measles vaccine.

If in doubt, vaccinate as there are no undue effects from vaccinating an individual who is immune.

Prophylaxis

For susceptible contacts, consider the use of MMR vaccine, human normal immunoglobulin (HNIG) or intravenous immunoglobulin (IVIG) as described in the *Immunisation Handbook 2011*. There is some evidence that a single dose of measles–mumps–rubella (MMR) vaccine, when given to an unvaccinated person within 72 hours of first contact with an infectious person, may reduce the risk of developing disease.

HNIG is available from the New Zealand Blood Service and can be obtained by contacting the local hospital blood bank.

[1] Measles vaccine was introduced into New Zealand in 1969.

Restriction

Advise susceptible contacts to avoid attending school, early childhood services or community gatherings, and to avoid contact with other susceptible individuals, until 14 days after last exposure to the infectious case. The medical officer of health should consider whether it is necessary to use exclusion provisions in the Health (Infectious and Notifiable Diseases) Regulations 1966, and from early childhood services using the Education (Early Childhood Centres) Regulations 1998.

Given that post-exposure MMR vaccination cannot guarantee protection, susceptible contacts who have received their first MMR vaccination within the 72-hour period after first exposure should also be subject to these restrictions (unless they subsequently meet the criteria for immunity).

Non-susceptible contacts need no restrictions (see 'Acceptable presumptive evidence of immunity' above).

Counselling

Advise all contacts to seek early medical attention if symptoms develop and take precautions so as not to infect others. It is important they telephone and alert the health provider before attending their medical centre to prevent the risk of spreading the virus in health care settings.

Other control measures

Health education

Stress the importance of two doses of measles vaccination for all children and encourage early childhood services to keep up-to-date immunisation records of attending children.

Two doses of MMR vaccine are recommended for all children (without contraindications): the first at 15 months of age and the second at 4 years of age. Where dose/s have been delayed or missed, catch-up vaccination is recommended. This applies to anyone born from 1 January 1969.

All children and unimmunised adults are eligible for a free primary course (two doses of MMR vaccine).

Depending on circumstances, such as during an outbreak or prior to international travel, the first dose can be given from 12 months of age and the second dose 1 month after the first dose. During a generalised community outbreak, an extra dose may be offered to infants 6–12 months of age, but as effectiveness cannot be guaranteed, all children still need two further doses when they are over 15 months of age. This is because the seroconversion rate is lower when MMR is administered to an infant under 12 months of age.

Infection control

Ensure that the attending medical practitioner and laboratory collection rooms understand the importance of prompt isolation of a suspected case within their health care facility and the need to leave the consultation/examination room vacant for 2 hours after the suspected case has left it. Visits of cases and contacts (who may be entering the infectious period) to laboratory collection rooms should be planned ahead by telephone.

Reporting

Ensure complete case information is entered into EpiSurv.

If an outbreak occurs, inform the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

References and further information

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