THE MANAGEMENT OF SUSPECTED CASES OF MEASLES PRESENTING TO PAEDIATRIC A&E

BACKGROUND

‘Measles is an acute viral illness caused by a morbillivirus of the paramyxovirus family.’ It is highly infectious, almost twice as infectious as other common childhood infectious diseases, and requires vaccine coverage of 83%-94% in order to achieve herd immunity.

Since 2006 there has been a rapid increase in the number of confirmed cases of measles in England and Wales. Following the measles-rubella campaign in 1994 the incidence declined, with the number of confirmed cases per year between 1996 and 2001 ranging from as low as 56 to 117 cases per year. However, in 2006 the number of confirmed cases rose to 740, followed by 990 in 2007, and 1370 in 2008. Data for 2009 Jan-April has confirmed 640 cases already this year.

“Features strongly suggestive of measles:
• Rash for at least three days
• Fever for at least one day
• At least one of the following: cough, coryza or conjunctivitis”

DIFFERENTIAL DIAGNOSIS

Many of the common childhood viral illnesses present with very similar clinical features as those seen in measles. A study of the infectious causes of a morbilliform rash and fever in children presenting to primary care in a highly immunized English population found laboratory confirmation of the infection in 48% of the 195 children. No cases of measles or rubella were detected.

Confirmed diagnosis included:
• Parvovirus (17%);
• Group A streptococcus (15%) which can cause Scarlet fever;
• Human herpesvirus type 6 (6%);
• Enterovirus (5%);
• Adenovirus (4%);
• Group C streptococcus (3%)5.

Another commonly misdiagnosed differential is Kawasaki’s disease.
CLINICAL FEATURES

1. **Prodromal stage**, characterized by onset of:
   - Fever
   - Malaise
   - Coryza
   - Cough
   - Conjunctivitis

2. **Morbilliform rash**
   - Discrete erythematous maculopapular rash initially.
   - Starting behind the ears and on head, spreading to trunk and limbs over 3-4 days.
   - Becomes blotchy and confluent.
   - May desquamate in second week.

3. **Koplik spots**
   - Small red spots with bluish-white centres' (like grains of salt) appearing on mucous membranes of mouth 1-2 days before onset of rash.

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HISTORY AND EXAMINATION

In addition to exploring the presence of clinical features and timing of onset it is important to ask about the following information:

- Immunization history:
  - has the patient received the full MMR course (i.e. two doses of MMR)
  - When was the last dose given
- Social history:
  - School/Nursery attending
  - Low MMR vaccination coverage in contacts/community/locally.
  - Recent travel to high incidence countries e.g. India or Africa
- Contacts history:
  - Who has the patient been in contact with in the last 2 weeks?
  - Household contacts
  - Any contact with confirmed measles cases
- Contacts with potentially vulnerable patients: immunocompromised, pregnant, under 1 year of age.

**MANAGEMENT OF ANY CLINICALLY DIAGNOSED/SUSPECTED CASE OF MEASLES**

Measles is diagnosed clinically. It is a notifiable disease, and notification is based on a **clinical** diagnosis, i.e. the doctor seeing a patient whom they **suspect** has measles is required by law to report it. 

- Isolate patients within area of A&E to reduce spread to vulnerable patients.

- During working hours:
  1. Contact microbiology consultant to discuss obtaining oral fluid testing kit. If this sample is taken in A&E then you need to ensure:
     i. Full MMR immunisation history is obtained from the patient
     ii. The date of onset of illness is recorded.
  2. Notify our local health protection unit (HPU) in Leatherhead of suspected case by phone 8am-5pm: 01372 824262.
     They will wish to know about any vulnerable contacts (see page 5).
     Inform the HPU if an oral fluid test has been performed.
  3. Complete **Notification of infectious disease** form (you receive £3.26 payment for this).

- Out of hours:
  1. Take a dry sterile swab of the nasal passage and back of throat with a viral swab (green top swab, NOT blue bacterial swab).
  2. Complete **Notification of infectious disease** form (you receive £3.26 payment for this).
     Inform HPU the following day. The HPU will issue the patient directly with a special 'saliva test kit' (see below), either via their GP or to their home address, about one week later.
  3. If you any concerns about vulnerable patients/contacts an HPU consultant can be contacted on out of hours (i.e. 5pm-8am and weekends) number: 0870 238 5156.

- Offer patient/parents advice on symptomatic treatments e.g. drinking plenty of fluids and regular paracetamol.

- Give advice on school/nursery exclusion (see page 4) and avoidance of vulnerable contacts.

- Inform the patient’s GP of suspected diagnosis.

- Discharge patient provided clinically stable with advice of potential complications of measles (see page 4) and what symptoms to look out for.

- Inform Infection Control Team at St Peter’s hospital. It is the departments’ responsibility to produce a list of other patients who may have come into contact with the case in hospital.
• If any non-immunised staff members have been in contact with the suspected case please inform Occupational health.

**DIAGNOSTIC TESTING FOR MEASLES**

**Oral Fluid testing**

Saliva test kits are issued to all suspected cases by the HPU. It tests for measles specific antibodies (IgM/IgG) in the saliva, therefore kits are sent to patients one week after we notify them of a suspected case to ensure antibodies will be present at the time of testing. Results can take up to two weeks. Their purpose is not really diagnostic, as diagnosis is based on clinical judgment, but instead monitoring disease spread and epidemiological data.

These kits are usually issued only by the HPU, however Dr Kirk has negotiated that we can keep a small supply of our own kits in St Peter's laboratory. Therefore if you are seeing a suspected case between the hours of 9am and 5pm you may obtain a kit by contacting the on-call microbiology consultant. It is essential that when this is done an accurate MMR vaccination history and date of onset of illness is recorded.

**Viral swabs**

Out of hours (5pm-9am) the oral fluid testing kits will not be available. Instead a dry sterile swab of the nasal passage and back of throat with a viral swab (green top) can be obtained and sent for measles PCR. Be aware that these results can take up to 10 days.

Alternative diagnostic methods exist. These should be discussed with the microbiology consultant:

- Serology (IgG/IgM) on serum, oral fluid and possibly CSF samples
- PCR/genotyping on oral fluid, throat swabs, NPA, urine or CSF
- Plaque reduction neutralization assay on serum samples
- Virus culture of NPA, throat swab, or urine.

**EXCLUSION FROM SCHOOL/NURSERY**

Measles is most infectious from 4 days before the onset of rash to 4 days after. The health protection agency (HPA) recommends children are kept away from school/nursery for **5 days following the onset of rash**.

**COMPLICATIONS OF MEASLES INFECTIONS**

Common complications include:

- Otitis media (7-9%)
- Pneumonia (1-6%)
- Diarrhoea (8%)
- Convulsions (1 in 200)

Rare but serious complications include:

- Encephalitis (1 in 1000) (several different acute forms of encephalitis can occur)
- Death (1 in 5000 cases in the UK)
- Sub-acute Sclerosing Pan-Encephalitis (SSPE). A rare but fatal, late complication occurring in only 1 in 25,000 cases. Most commonly around seven years after the onset of infection, but can be up to two to three decades after.
VULNERABLE PATIENTS/CONTACTS

1. **Under 1s**: ‘Case fatality rates for measles are age-related. They are high in children under one year of age, are lowest in children aged 1 to 9 years and then rise again with advancing age’.

2. **Pregnant women**: Maternal infection with measles can cause pre-term delivery or intrauterine death. It is not associated with congenital infection or damage.

3. **Immunocompromised children and adults**: ‘Complications of measles are more common and more severe in poorly nourished and/or chronically ill children, including those who are immunosuppressed.’

PROTECTION OF SUSCEPTIBLE CASES

**MMR vaccine**

The MMR vaccine can be used to protect susceptible contacts from suspected measles. It should be given promptly, ideally within 3 days, in order to be effective. There are no ill effects from vaccinating those who are already immune, or individuals incubating measles. The MMR can be given from six months of age. Children who have already received one dose of the MMR and are over the age of 18 months may be able to use this second dose as their primary immunisation schedule. Further guidance is available from the HPU or DoH publication – ‘The Green Book’.

**Human Normal Immunoglobulin (HNIG)**

“HNIG is prepared from pooled plasma derived from blood donations and contains antibody to measles and other viruses prevalent in the population”. It may be given to prevent or attenuate an attack in:

1. Immunocompromised contacts (confirmation of index case should not be waited for prior to commencing treatment).
2. Pregnant women (HNIG may attenuate infection in mother but there is no evidence that it prevents fetal loss).
3. Infants under the age of 12 months

HNIG is most effective if given within 72 hours, but can be effective even if given within 6 days. In all cases this should be conducted in collaboration with the local HPU or microbiologist. For further information refer to HPA Immunoglobulin Handbook.

ADDITIONAL USEFUL RESOURCES:

- Health Protection Agency Website
- The Green Book
- MMR Information for parents
- HPA guidelines, information and advice on rashes in pregnancy
REFERENCES


Guideline Author Dr. Emily Robertson, Dr Kate Brocklesby
Prepared 13/11/2009
Ratified for use 18/12/2009
Review Dec 2012