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Rubella

Rubella vaccine introduced in 1971/ MMR introduced in 1988

NOTIFIABLE

Rubella
September 2016

In some circumstances, advice in these guidelines may differ from that in the Summary of Product Characteristics of the vaccines. When this occurs, the recommendations in these guidelines, which are based on current expert advice from NIAC, should be followed.

Introduction

Rubella is a mild disease caused by a toga virus whose only host is humans. Up to 50% of infections are asymptomatic. Its most serious effects are on the foetus, and prevention of the congenital rubella syndrome (CRS) is the main aim of rubella vaccination.

Epidemiology

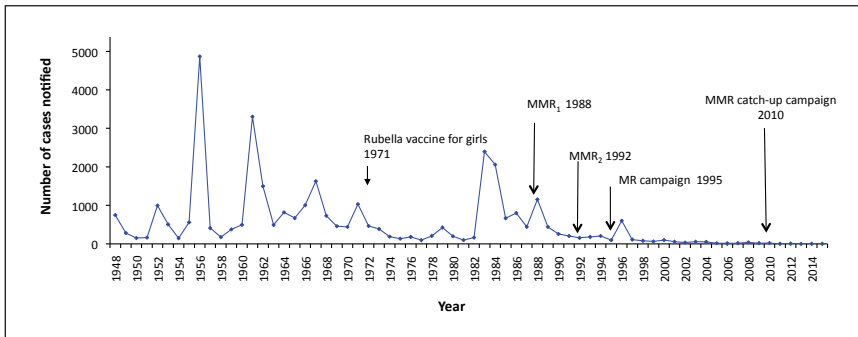
Prior to the introduction of Rubella vaccine, most infections occurred in winter or early spring. The incubation period is 14-21 days, with most developing a rash 14-17 days after exposure. Individuals with rubella are most infectious from 1 week before to 1 week after onset of the rash. Infants with congenital rubella may shed high titres of virus from their nasopharynx or in their urine for over 1 year.

Since the introduction of rubella vaccine in 1971, notifications of rubella have decreased (Figure 20.1). There is a longer interval between outbreaks and the numbers infected are smaller. In order to prevent rubella transmission all children are recommended vaccination with a rubella containing vaccine. In Ireland rubella vaccine is only available as part of the combined measles, mumps and rubella (MMR) vaccine.

The last confirmed acute rubella case was notified in 2009. Since then, although each year suspect rubella cases are notified, to date none have met the case definition for confirmed. A probable case (with exposure in another country) was notified in 2014. In April 2016 WHO announced that rubella transmission has been interrupted and Ireland is now considered free of endemic rubella. However the risk of transmission if the virus is re-introduced still exists. Rubella continues to occur in other countries. Worldwide, over 100 000 babies are born with Congenital rubella syndrome (CRS) every year.

Figure 20.1 Number of rubella notifications in Ireland, 1948-2015.

Source: HPSC



Effects of rubella

When symptoms occur they are generally mild. In children, rash is usually the first manifestation and a prodrome is rare. In older children and adults there is often a prodromal illness with low-grade fever, malaise, coryza and mild conjunctivitis. Lymphadenopathy involving post-auricular and sub-occipital glands may precede the rash. The rash is an erythematous maculopapular rash which initially occurs on the face and neck. The rash is short-lived and is not specific to rubella. Where clinical features are suggestive of rubella laboratory confirmation is recommended

Arthralgia and arthritis, which may last for up to 1 month, occur frequently in adult females (up to 70%) but are rare in adult males and children. Fingers, wrists and knees are usually affected.

Post-infectious encephalitis occurs in 1 in 6,000 cases, more often in adult females. Haemorrhagic manifestations occur in approx. 1 in 3,000 cases, more commonly in children and are due to thrombocytopenia or vascular damage. Cerebral, gastrointestinal or renal haemorrhage may rarely result. Effects may last from days to months, but most patients fully recover.

Congenital rubella syndrome (CRS) (notifiable)

Maternal rubella infection in pregnancy may result in foetal loss or major defects affecting almost all organ systems. Some manifestations may be delayed for up to 4 years. The congenital rubella syndrome (CRS) comprises eye, ear, heart and CNS defects. Deafness is the most common and sometimes the only manifestation, especially when infection occurs after 16 weeks gestation. Cardiac defects include patent ductus arteriosus, pulmonary stenosis, septal defects and coarctation of the aorta. Eye defects include cataracts, microphthalmia, pigmentary retinopathy and glaucoma. Neurological problems include encephalitis, microcephaly, mental handicap, and behavioural problems. Other abnormalities include hepatitis, splenomegaly, thrombocytopenia and growth retardation. Diabetes mellitus occurs frequently in later childhood in those with the CRS. Reinfection with rubella may occur, as impaired cell-mediated immunity has been demonstrated in some children with CRS.

The overall risk of CRS depends on the stage of pregnancy. Up to 85% of infants infected in the first 12 weeks gestation will be affected. The risk of foetal damage is about 50% when infection occurs between 12-<16 weeks and 25% (mainly deafness) when infection occurs between from 16-20 weeks of pregnancy. Defects are rare after 20 weeks.

Preconception testing for rubella immunity is recommended.

Assessment of immunity

Satisfactory evidence of protection against rubella includes documentation of having received at least one dose of a rubella-containing vaccine or a positive antibody test for rubella. It has been reported that viraemic infection can occur in vaccinated persons who have low levels of detectable antibody. On very rare occasions, clinical re-infection and resulting foetal infection have been reported and CRS has occurred in infants born to women with serological evidence of rubella immunity prior to reinfection.

Rubella vaccine

Rubella vaccine is only available as MMR (Measles, Mumps and Rubella vaccine). The vaccine contains live attenuated measles, mumps and rubella which are cultured separately and mixed before lyophilisation.

Over 95% of recipients are likely to develop lifelong immunity to rubella after a single dose of a rubella containing vaccine.

Low rates of seroconversion occur in those under 12 months of age, because of maternal antibodies.

Laboratory investigation to determine vaccine response is not routinely recommended.

An up-to-date list of licensed vaccines can be accessed on the HPRA website www.hpra.ie

A list of the vaccines currently available from the National Cold Chain Service can be found at www.immunisation.ie

MMR does not contain thiomersal or any other preservatives. It must be kept refrigerated at +2 to +8°C, and protected from light. It should be used within 1 hour of reconstitution. Failure to adhere to these recommendations can result in loss of vaccine potency and diminished effectiveness.

If a vaccine has been frozen it should not be used.

Scientific evidence shows no association between the MMR vaccine and autism or inflammatory bowel disease.

Dose and route of administration

The dose is 0.5 ml by intramuscular injection into the deltoid or the anterolateral thigh.

Alcohol swabbing of the injection site should be avoided as alcohol can inactivate the MMR vaccine. If an alcohol swab is used injection should be delayed for 30 seconds to ensure the alcohol will have evaporated.

MMR vaccine may be given at the same time as any other vaccine (except yellow fever vaccine).

There must be an interval of 4 weeks between the administration of MMR and varicella or zoster vaccines if they are not given at the same time.

Indications

1. All children at 12 months of age, with a second dose at 4-5 years of age. If children aged under 18 months are given the second dose less than 3 months after the first dose, they need a third dose at 4-5 years to maximise the response and to ensure full protection.

MMR vaccine can be given to those who have a history of measles, mumps or rubella infection.

Children receiving their first dose of MMR vaccine at 4-5 years should be given a second dose one month later.

Older unvaccinated children should be given MMR vaccine as soon as possible and a second dose one month later.

2. Children and adults of migrant or ethnic minority groups or coming from low-resource countries are less likely to have received rubella vaccine. Without documented evidence of MMR vaccination they should be offered one dose of MMR vaccine. Two doses may be needed for protection against measles and mumps.
3. All rubella seronegative women of child bearing age should be offered 1 dose of MMR vaccine. Satisfactory evidence of protection is documentation of having received at least one dose of rubella containing vaccine or a positive rubella antibody test (IgG level >10IU/ mL).

If a woman has documented evidence of having received 1 dose of a rubella-containing vaccine, *irrespective of rubella serology*, no further rubella (MMR) vaccine is necessary.

Two doses may be needed for protection against measles and mumps.

4. Health-Care Workers (HCWs) in the following situations should be vaccinated (see Chapter 4).
 - Those who do not have a positive rubella antibody test (IgG level >10IU/ mL) or documentation of having received at least one dose of a rubella-containing vaccine should be given a dose of MMR vaccine. Two doses may be needed for protection against measles and mumps.
 - If an outbreak occurs in an institution or an area served by an institution, HCWs without evidence of immunity to rubella, or without documented evidence of having received at least one dose of a rubella containing vaccine should be given a dose of MMR.

Protection is important both for themselves and in the context of their ability to transmit rubella to vulnerable groups.

Antibody response to the rubella component of the MMR vaccine does not develop quickly enough to provide effective prophylaxis after exposure to suspected rubella. However, the vaccine can provide protection against future infection. Therefore, contact with suspected rubella provides a good opportunity to offer MMR to previously unvaccinated individuals. If the individual is already incubating rubella, MMR vaccination will not exacerbate the symptoms.

Human normal immunoglobulin is not recommended for post-exposure protection from rubella since there is no evidence that it is effective.

Contraindications

1. Anaphylaxis to any of the vaccine constituents.
2. Significantly immunocompromised persons, such as those with untreated malignant disease and immunodeficiency states other than HIV infection, and those receiving immunosuppressive therapy, high-dose x-ray therapy and current high-dose systemic corticosteroids (see Chapter 3).
3. Pregnancy. Furthermore, pregnancy should be avoided for 1 month after MMR.
4. MMR should not be administered on the same day as yellow fever vaccine as co-administration of these two vaccines can lead to suboptimal antibody responses to yellow fever, mumps and rubella antigens. If rapid protection is required then the vaccines should be given on the same day or at any interval and an additional dose of MMR should be given at least four weeks later.

The following are NOT contraindications to MMR vaccine

1. Allergy to egg including anaphylaxis following egg. Currently-used measles, mumps and rubella vaccines do not contain significant amounts of egg cross-reacting proteins and recent data suggest that anaphylaxis following MMR is not associated with hypersensitivity to egg antigens but to other vaccine components (Gelatin or Neomycin).
2. Breast-feeding.
3. HIV-positive patients who are not severely immunocompromised.
4. Personal or family history of convulsions.
5. Immunodeficiency in a family member or household contact.
6. Uncertainty as to whether a person has had 2 previous MMR vaccines.

7. If women have received anti-RhD immunoglobulin it is not necessary to defer MMR vaccination as the response to the vaccine is not affected.
8. Those with hereditary fructose intolerance should be offered MMR vaccine.

Precautions

1. Acute severe febrile illness, defer until recovery.
2. Injection with another live vaccine within the previous 4 weeks.
3. Recent administration of blood or blood products.
Blood and blood products may contain significant levels of virus-specific antibody, which could prevent vaccine virus replication. MMR should be deferred for at least 5 months after receipt of low-dose HNIG, 6 months after packed red-cell or whole-blood transfusion and 11 months after high-dose HNIG (as for e.g. Kawasaki disease) see Chapter 2 Table 2.4. If the MMR vaccine is administered within these timeframes, 1 or 2 doses should be given outside these times.
4. Tuberculin skin testing should be deferred for at least 4 weeks after MMR vaccine as the measles vaccine can reduce the tuberculin response and could give a false negative result.
5. Patients who developed thrombocytopenia within 6 weeks of their first dose of MMR should undergo serological testing to decide whether a second dose is necessary. The second dose is recommended if the patient is not fully immune to the 3 component viruses.
6. Topical tacrolimus and other topical immunomodulators should be discontinued for 28 days before and not restarted until 28 days after the administration of MMR vaccine.

Adverse reactions

Local: Soreness and erythema may occur at the injection site (3-8%).

General: Fever (6%), rash (7%), headache, vomiting and salivary gland swelling may occur. A febrile convulsion occurs in 1 in 1,000 children.

'Mini-measles' may occur 6-10 days after immunisation and consists of mild pyrexia and an erythematous rash. 'Mini-mumps' with salivary gland swelling may rarely occur during the third week after immunisation. Very rarely, anaphylaxis, erythema multiforme, thrombocytopenia and nerve deafness have been reported.

The rubella component may occasionally produce a rash, mild arthralgia, and lymph-node swelling 2-4 weeks post-vaccination, particularly in post-pubertal females (up to 25% of recipients). The incidence is lower than after natural disease.

There is no evidence of congenital rubella syndrome or increase in other teratogenic effects in women inadvertently given rubella vaccine during pregnancy, but pregnancy remains a contraindication.

Adverse reactions are considerably less common (under 1%) after a second dose of MMR.

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