14 Mumps

Mumps vaccine introduced in 1988 as part of MMR vaccine

NOTIFIABLE

In some circumstances, advice in these guidelines may differ from that in the product Summary of Product Characteristics (SmPC). When this occurs, NIAC advises that the recommendations in these guidelines, which are based on current expert advice from NIAC, are followed.

Contents

Key changes

14.1 Introduction

Mumps is an acute viral illness caused by a paramyxovirus. Humans are the only known host. It is characterised by swelling of one or more of the salivary glands, usually the parotid gland. The virus can be isolated from 2-7 days before to nine days after onset of symptoms. Approximately 10 secondary infections will result from each index case in a fully susceptible population R_0=10. It is highly infectious to nonimmune individuals and is the only cause of epidemic parotitis.

Mumps became a notifiable disease in 1988. MMR vaccine was first introduced in 1988.

14.2 Epidemiology

Although mumps cases occur at any time of year, an increase in cases is noted during late winter and early spring.

Transmission

Transmission is from person to person via respiratory droplets and saliva, direct contact, or fomites.

Incubation period

The incubation period is approximately 17 days (range 14-25).

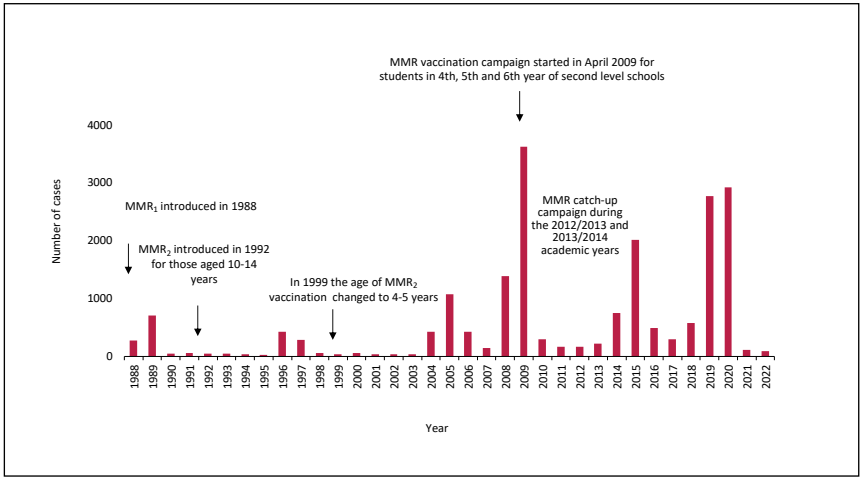
Infectious period

Cases are infectious from about six days before to 10 days after onset of symptoms, although maximum infectivity is from two days before to five days after onset of symptoms.

High-risk groups are those in a close contact environment such as pre-school, school and third-level colleges, healthcare workers, and international travellers.

In recent years major national mumps outbreaks have occurred (2004/2005, 2008/2009, 2014/2015, 2019/2020) (Figure 14.1). In these outbreaks the age groups most affected were teenagers and young adults.

Figure 14.1 AAnnual numbers of mumps notifications in Ireland, 1988-2022.
Source: HPSC



14.3 Effects of mumps

Up to 40% of mumps infections may be asymptomatic, particularly in children, and up to 50% will have non-specific or primarily respiratory symptoms.

Prodromal symptoms are nonspecific, last 3-5 days and include myalgia, low-grade fever, anorexia, and headache. Salivary gland inflammation, particularly of the parotid gland (unilateral or bilateral), occurs in 30-40% of all patients, and in over 90% of symptomatic patients.

Central nervous system (CNS) involvement is the most common extrasalivary complication of mumps. It presents most often as aseptic meningitis rather than as encephalitis. It occurs up to three times more often in males than females and is more common in adults than children. It usually presents within the first week after parotid swelling. Aseptic meningitis has been seen in up to 10% of patients with a history of parotitis. This percentage increases to 50% in those patients without parotid gland swelling. Clinical findings include headache, fever, nausea, vomiting, and neck stiffness. Encephalitis is rare, occurring in 0.1% of cases. Marked changes in sensorium, convulsions, paresis, and/ or paralysis present in patients with encephalitis, not typically in aseptic meningitis.

Other CNS manifestations include ataxia, transverse myelitis, and sensorineural deafness. Meningoencephalitis occurs more frequently in adults than children and in boys more than girls.

CNS involvement carries a good prognosis and is usually associated with a complete recovery.

Other complications include pancreatitis (4%), orchitis (approximately 25% of post-pubertal men, rarely causing sterility), oophoritis and mastitis in post-pubertal females, and nephritis. Rarer complications include arthralgia, arthritis and cardiac abnormalities. Death is exceedingly rare.

14.4 Mumps vaccine

In 1988 a mumps vaccine as part of a combined measles, mumps and rubella vaccine (MMR) was introduced for children aged 15 months. In 1992 a second dose of MMR vaccine was recommended for children at 10-14 years of age. In 1995 a measles and rubella (MR) vaccination catch-up campaign was carried out.

In 1999 the age for the second dose of MMR vaccine was reduced to 4-5 years and in 2000 the age for first dose was reduced to 12-15 months. In 2009 an MMR vaccination catch-up campaign for children in the senior cycle (last three years) of second level schools was undertaken in response to a national mumps outbreak. In 2012-2014 MMR catch-up vaccination campaigns were carried out in second level and primary schools in response to suboptimal vaccine uptake in these age groups.

Mumps continues to be endemic in Ireland. In the past decade a number of outbreaks in highly vaccinated populations have been reported in Ireland.

Mumps vaccine is only available as MMR (Measles, Mumps and Rubella vaccine). The vaccines contain live attenuated measles, mumps and rubella viruses that are cultured separately and combined.

Two vaccines are available in Ireland:

MMRvaxPRO (MSD)

Priorix (GSK).

Storage
MMR vaccines must be kept refrigerated at +2 to +8°C and protected from light. If a vaccine has been frozen it should not be used. MMR does not contain thiomersal or any other preservatives. They should be used within one hour of reconstitution.

Failure to adhere to these recommendations can result in loss of vaccine potency and diminished effectiveness.

Licensed indications
Active immunisation of children aged nine months or older, adolescents, and adults against measles, mumps and rubella.

Mumps vaccine effectiveness
Studies of the protective effect of a single dose of mumps-containing vaccine varies between 61-91%. Vaccine effectiveness after two doses is estimated to be up to 88%. Lower 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.

There is no evidence to recommend the use of single vaccines against measles, mumps and rubella instead of the combination MMR vaccine. No single antigen vaccines are licensed in Ireland.

Dose, route of administration and schedule
The dose is 0.5 ml by intramuscular injection (IM) into the deltoid or the anterolateral thigh. It may be given subcutaneously (SC) to those with significant thrombocytopenia or bleeding disorder.

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 can be given at the same time as any other live vaccine except yellow fever vaccine. If not given on the same day they must be separated by at least four weeks*.

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

*Co-administration of MMR and yellow fever vaccines can lead to suboptimal antibody responses to mumps, rubella and yellow fever antigens. If rapid protection is required, the vaccines may be given at any interval and an additional dose of MMR given at least four weeks later.

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

14.5 Recommendations

14.5.1 Routine childhood vaccination:
All children at 12 months of age should receive an MMR vaccine, with a second dose at 4-5 years of age. *If protection is urgently required*, the second dose can be given four weeks after the first.

Children receiving their first dose of MMR vaccine ≥ 4-5 years of age should be given a second dose four weeks later.

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

14.5.2 Migrants, ethnic minority groups and those coming from low resource countries

These groups are less likely to have been vaccinated with MMR. Without documented evidence of mumps vaccination, they should be offered two doses of MMR vaccine at least four weeks apart.

14.5.3 Healthcare workers

All healthcare workers, both clinical and non-clinical, who have direct patient contact should be immune to measles, mumps and rubella. This applies to roles in which:

- their work requires face to face contact with patients, or
- their normal work location is in a clinical area such as a ward, emergency department or outpatient clinic, or
- their work frequently requires attendance in clinical areas.

As the clinical interpretation of mumps serology post-vaccine can be challenging, detectable mumps IgG at a single time-point is not considered sufficient evidence for immunity.

Acceptable presumptive evidence of immunity against **mumps** includes at least one of the following:

- written documentation of vaccination with two doses of MMR vaccine at least four weeks apart

or

- birth in Ireland before 1978. Most adults born in Ireland before 1978 are likely to have had mumps infection. MMR vaccine should be offered to such individuals on request if they are considered at high risk of exposure.

HCWs born since 1978 without evidence of two doses of MMR vaccine should be offered one or two doses of MMR vaccine as required at least four weeks apart so that a total of two doses are received.

If an outbreak of mumps occurs in an institution or an area served by an institution, all HCWs without evidence of two doses of MMR vaccine should be offered one or two doses of MMR vaccine (including those where immunity was presumed by birth before 1978) as required. This is to prevent ongoing spread to susceptible staff during the outbreak.

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

> Serological testing after routine vaccination is not recommended.

Antibody response to the mumps component of the MMR vaccine does not develop quickly enough to provide effective prophylaxis after exposure to suspected mumps. However, the vaccine can provide protection against future infection. Therefore, contact with suspected mumps provides a good opportunity to offer MMR to previously unvaccinated individuals.

If the individual is already incubating mumps, MMR vaccination will not exacerbate the symptoms.

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

Contraindications

1. Anaphylaxis to a previous dose of MMR or to any of the vaccine constituents.
2. Significantly immunocompromised persons (see Chapter 3), e.g., primary immunodeficiency or acquired immunodeficiency (from disease (including HIV/AIDS), or immunosuppressive therapy (including biologics)).
3. Pregnancy. Furthermore, pregnancy should be avoided for one month after MMR.

The following are NOT contraindications to MMR vaccine

1. Allergy to egg including anaphylaxis following egg. MMR 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. Breastfeeding.
3. People living with HIV who are not severely immunocompromised (see Chapter 3).

4. Personal or family history of convulsions.
5. Close contacts of immunosuppressed individuals should be fully immunised with MMR, as there is no evidence of harm from the transmission of measles, mumps and rubella viruses from recent vaccinees.
6. Uncertainty as to whether a person has had two previous MMR vaccines.
7. Recent injection of anti-RhD immunoglobulin.
8. Hereditary fructose intolerance.
9. Use of topical tacrolimus does not affect the immunogenicity of the MMR vaccine.
10. Priorix contains 334 micrograms of phenylalanine per 0.5ml dose. Though phenylalanine may be harmful to individuals with phenylketonuria (PKU) the amount of phenylalanine contained in Priorix is negligible and vaccination with Priorix is advised in individuals with PKU.

Precautions

1. Acute severe febrile illness, defer until recovery.
2. Injection with another live vaccine within the previous four weeks. Two live vaccines can be administered on the same day without causing interference e.g., MMR and Varicella. However, MMR vaccine should not be routinely 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, 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.
3. Family history of primary immunodeficiency (e.g., severe combined immunodeficiency syndrome (SCID)) defer vaccination until immune status is determined.
4. Recent administration of blood, blood products, HNIG or specific immunoglobulin could prevent vaccine virus replication. MMR should be deferred for specific intervals depending on product received as outlined in Chapter 2 Table 2.6.

5. Tuberculin skin testing should be deferred for at least four weeks after MMR vaccine as the vaccine can reduce the tuberculin response and could give a false negative result.
6. Patients who developed thrombocytopaenia within six 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 three component viruses.
7. Live vaccines should not be given to infants after *in utero* exposure to infliximab for 12 months after birth. However, administration of MMR vaccine may be considered before 12 months where there is a clear clinical indication and clear benefit, if infant infliximab serum levels are undetectable or if infliximab administration was limited to the first trimester of pregnancy.
8. Infants of breastfeeding mothers receiving monoclonal antibody treatment (including infliximab) post-partum should be immunised with MMR vaccines according to routine schedule. If there is any doubt as to whether an infant due to receive a live attenuated vaccine such as MMR may be immunosuppressed due to the mother's therapy, specialist advice should be sought.

Adverse reactions

Local: very common: erythema at injection site.
common: soreness, swelling.

General: common: rhinitis, rash.

"Mini-measles" may occur 6-10 days after immunisation and consists of mild pyrexia and an rythematous rash.

'Mini-mumps' with salivary gland swelling may rarely occur during the third week after immunisation.

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.

Febrile convulsions occur rarely (<1/1,000 children).

Very rarely, erythema multiforme, thrombocytopenia and nerve deafness have been reported.

There is no evidence of congenital rubella syndrome or increase in other teratogenic effects in women inadvertently given MMR vaccine. However, pregnancy remains a contraindication to its administration

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