

3.13 MUMPS

Virology

Mumps is a paramyxovirus, genus *Rubulavirus*, with a single-stranded RNA genome. It is rapidly inactivated by heat, formalin, ether, chloroform and ultraviolet light.¹

Clinical features

Mumps is an acute viral illness with an incubation period of 14 to 25 days.² Asymptomatic infection occurs in one-third of cases.³ Symptomatic disease ranges from mild upper respiratory symptoms to widespread systemic involvement.³ A high proportion of mumps infections involve non-specific symptoms including fever, headache, malaise, myalgia and anorexia.⁴ The characteristic bilateral, or occasionally unilateral, parotid swelling occurs in 60 to 70% of clinical cases.⁴ Benign meningeal signs appear in up to 15% of cases, but permanent sequelae are rare. Nerve deafness is one of the most serious of the rare complications (1 in 500 hospitalised cases). Orchitis (usually unilateral) has been reported in up to 20% of clinical mumps cases in post-pubertal males, but subsequent sterility is rare. Symptomatic involvement of other glands and organs has been observed less frequently (pancreatitis, oophoritis, hepatitis, myocarditis, thyroiditis, mastitis).¹⁴ Patients may be infectious from 6 days before parotid swelling to 9 days after.² Mumps encephalitis has been reported to range as high as 1 in 200 cases, with a case-fatality rate of around 1.0%.

Mumps infection during the first trimester of pregnancy may result in spontaneous abortion.^{3,4} Maternal infection is not associated with an increased risk of congenital malformation.^{3,4}

Epidemiology

Mumps is reported worldwide, and is a human disease. Transmission is by the respiratory route in the form of air-borne droplets or by direct contact with saliva or possibly urine.² Before universal vaccination, mumps was primarily a disease of childhood, the peak incidence being in the 5–9 year age group. However, since 2000, peak rates have been reported in older adolescents and young adults, especially the 20–24 year age group.^{5–7} Between 2001 and 2005, the average notification rate for mumps in Australia was 0.6 per 100 000.⁸ There have been recent outbreaks of mumps in the USA, and also in the United Kingdom, where the peak rates of disease have been in the 18–24 year age group.^{9,10} Approximately 2000 cases were reported in the USA in a 2006 outbreak, parotitis being reported in 66% of clinical cases.¹¹ Mumps attack rates in outbreaks are lowest in individuals who have received 2 doses of mumps-containing vaccines, as this provides optimal long-term protection.^{10,11} In Australia, over the 10-year

period from 1996 to 2005, mumps has been reported as the underlying cause of death in 4 subjects, all adults aged over 80 years.⁵⁻⁷

Vaccines

Monovalent mumps vaccine is no longer available in Australia. Mumps vaccination is provided using either MMR vaccine or MMRV vaccine when available.

Clinical trials of mumps vaccine indicate 95% seroconversion after a single dose of MMR.⁴ However, outbreak investigations and post-marketing studies have reported 1-dose vaccine effectiveness to be between 60 and 90%.¹⁰ Protection is greater in 2-dose vaccine recipients, who have seroconversion rates of up to 100%.^{4,10,12}

- **Priorix (MMR)** – GlaxoSmithKline (live attenuated measles virus (Schwarz strain), RIT 4385 strain of mumps virus (derived from the Jeryl Lynn strain) and the Wistar RA 27/3 rubella virus strain). Each 0.5 mL monodose of the reconstituted, lyophilised vaccine contains not less than $10^{3.0}$ CCID₅₀ (cell culture infectious dose 50%) of the Schwarz measles, not less than $10^{3.7}$ CCID₅₀ of the RIT 4385 mumps and not less than $10^{3.0}$ CCID₅₀ of the Wistar RA 27/3 rubella virus strains; lactose; neomycin; amino acids; sorbitol and mannitol as stabilisers.

Transport, storage and handling

Transport according to *National Vaccine Storage Guidelines: Strive for 5*.¹³ Store at +2°C to +8°C. Protect from light. Do not freeze. Reconstituted vaccine should be used immediately, but can be stored at +2°C to +8°C for up to 8 hours before use.

Dosage and administration

For both children and adults, the dose of MMR is 0.5 mL, administered by either SC or IM injection.

MMR can be given at the same time as other vaccines (including DTPa, hepatitis B, MenCCV and varicella), using separate syringes and injection sites. If MMR is not given simultaneously with other live viral parenteral vaccines (eg. varicella vaccine), they should be given at least 4 weeks apart (see 'Precautions' below).

Recommendations

All children should receive 2 doses of MMR vaccine (or MMRV vaccine, when available, if ≤ 12 years of age). Routine administration of MMR (or MMRV) is now recommended at 12 months and 18 months of age in order to maximise protection at an early age. The minimum interval between doses is 4 weeks.

In older individuals, who have received only 1 dose of mumps-containing vaccine, a second dose can be given, as MMR, at any age.

For further information on the recommendations for MMR (and MMRV when available) see Chapter 3.11, *Measles* and Chapter 3.24, *Varicella*.

Contraindications

See information on MMR and MMRV vaccines in Chapter 3.11, *Measles* and Chapter 3.24, *Varicella*.

Precautions

If MMR is not given simultaneously with other live viral parenteral vaccines (eg. varicella vaccine), they should be given at least 4 weeks apart.

See further information on MMR and MMRV vaccines in Chapter 3.11, *Measles* and Chapter 3.24, *Varicella*.

Adverse events

In Australia, vaccine-associated aseptic meningitis is not considered a problem. Post-licensure surveillance of mumps vaccine recipients in Germany, over a 2-year period, found no increase in cases of aseptic meningitis. However, other estimates in countries using mumps vaccines with different vaccine virus strains suggest 1 case occurs per 800 000–1 million doses.^{4,14} Vaccine-associated meningoencephalitis is invariably mild or asymptomatic and resolves spontaneously. When mumps virus is isolated from the cerebrospinal fluid in such cases, laboratory tests can be undertaken to distinguish between wild and vaccine strains. The assistance of State virology laboratories should be sought in such cases.

Re-vaccination with mumps-containing vaccines is not associated with an increased incidence of adverse events.

For further information on the adverse events associated with MMR and MMRV, see Chapter 3.11, *Measles* and Chapter 3.24, *Varicella*.

Use of immunoglobulin to prevent mumps

Normal human immunoglobulin (NHIG) has not been shown to be of value in post-exposure prophylaxis for mumps.^{1,15} Live mumps-containing vaccine does not provide protection if given after an individual has been exposed to mumps.^{1,15} However, if the exposure did not result in infection, the vaccine would induce protection against subsequent infection.

Use in pregnancy

MMR vaccine is not recommended in pregnancy due to the theoretical risk of transmission of the rubella component of the vaccine to a susceptible fetus (see Chapter 3.19, *Rubella*). Pregnancy should be avoided for 28 days after vaccination.¹⁶ Data on the use of MMRV vaccines in individuals >12 years of age are not available.

Variations from product information

See information on MMR vaccines in Chapter 3.11, *Measles*.

References

Full reference list available on the electronic *Handbook* or website <http://immunise.health.gov.au>.