MUMPS

Epidemic Parotitis

An infection that primarily affects the parotid glands, caused by the mumps virus which can impair male fertility.

Risk factor

About Mumps

Mumps is an infection of the salivary glands caused by the mumps virus (Pic. 1). The most common gland affected is the parotid gland which causes swelling (Pic. 2) at the angle of the jaw in front of the ear.

Mumps is highly contagious and spreads rapidly among people living in close quarters. The virus is transmitted by respiratory droplets or direct contact with an infected person. Only humans get and spread the disease.

Initial signs and symptoms often include fever, muscle pain, headache, and feeling tired. This is then usually followed by painful swelling of one or both parotid salivary glands. Symptoms typically occur 16 to 18 days after exposure and resolve after seven to ten days. Symptoms in adults are often more severe than in children. About a third of people have mild or no symptoms.

Mumps virus can be isolated from saliva, urine, blood, nasopharyngeal secretions, and seminal fluid. Collection of the specimen in the first three days of parotitis (inflammation of parotid gland) is optimal, but virus can still be detected in some cases up to nine days after onset of parotitis. Mumps is a clinical diagnosis that is made based on a history of exposure, prodromal constitutional symptoms (an early non-specific sign or symptom) (Pic. 3) and parotitis. Serologic/polymerase chain reaction (PCR) testing to confirm diagnosis is also available.

Diagnosis is usually suspected due to parotid swelling and can be confirmed by isolating the virus on a swab of the parotid duct. Testing for IgM antibodies (a basic antibody that is produced by B cells) in the blood is simple and may be useful; however, it can be falsely negative in those who have been immunized.

Like many other viral illnesses, there is no specific treatment for mumps. Symptoms may be relieved by the application of intermittent ice or heat to the affected neck/testicular area and by the ibuprofen for pain relief. Warm salt water gargles, soft foods, and extra
fluids may also help relieve symptoms. Patients are advised to avoid acidic foods and beverages, since these stimulate the salivary glands, which can be painful.

**Symptoms**

**Parotitis**

Swelling of the salivary glands, specifically the parotid gland, is known as parotitis, and it occurs in 60–70% of infections and 95% of patients with symptoms. Parotitis causes swelling and local pain, particularly when chewing. It can occur on one side but is more common on both sides in about 90% of cases.

**Orchitis**

Painful inflammation of the testicles in mumps in known as orchitis.

**Prodromal symptoms**

Fever and headache are prodromal symptoms of mumps, together with malaise (a feeling of general discomfort, uneasiness or pain, often the first indication of an infection or other disease) and loss of appetite.

**Other symptoms**

Other symptoms of mumps can include dry mouth, sore face and/or ears and occasionally, in more serious cases, loss of voice.

In addition, up to 20% of persons infected with the mumps virus do not show symptoms, so it is possible to be infected and spread the virus without knowing it.

**Associated diseases**

- orchitis

**Complications**

**Orchitis**

In post-pubertal males, the most common complication of mumps infection is orchitis. Orchitis typically occurs about 10 days after the onset of parotitis, although it can be seen up to six weeks later. Orchitis is typically unilateral, but bilateral orchitis manifests in 15-30% of cases. Orchitis may be accompanied by epididymitis (an inflammation of epididymis) up to 85% of the time.

**Meningitis, encephalomyelitis**

Other complications of mumps infection include meningitis (an acute inflammation of the protective membranes covering the brain and spinal cord), which may occur in up to 10% of cases. When meningitis does occur, it is typically seen 3-4 days after the onset of
parotitis. Acute encephalitis (a sudden onset inflammation of the brain) and encephalomyelitis (an inflammation of the brain and spinal cord) are rare. When acute encephalitis due to mumps occurs, it is typically self-limiting. Acute encephalomyelitis, on the other hand, tends to be much more severe. Case fatality rates for acute encephalomyelitis due to mumps virus are up to 10%, while the overall case fatality rate due to CNS (the central nervous system) complications from mumps virus has been reported to be about 1%.

Hearing loss

Hearing loss is another CNS complication of mumps infection. Permanent unilateral (one sided) hearing loss has been reported to occur in 1 of every 20,000 cases. Bilateral (both sided) hearing loss is much less frequent.

Oophoritis

Oophoritis (ovarian inflammation) has been reported to occur in 5% of post-pubertal females. Symptoms of oophoritis may include lower abdominal pain, vomiting and fever.

Mastitis

Mastitis (breast inflammation) has also been reported as a complication of mumps infection in post-pubertal females.

Other complications

Other rare complications associated with mumps infection include pancreatitis (an inflammation of pancreas), electrocardiography (ECG) abnormalities, myocarditis (an inflammation of the myocardium, the middle layer of the heart wall), polyarthritis (any disorder that affects 5 or more joints simultaneously), abnormal renal function, hepatitis (an inflammation of the liver tissue), cholecystitis (an inflammation of the gallbladder), kerato-uveitis (inflammation involving both the cornea and the uvea of the eye), hemophagocytic syndrome (an aggressive and life-threatening syndrome of excessive immune activation) and thrombocytopenia (a disorder characterized by abnormally low levels of thrombocytes, also known as platelets, in the blood).

Risk factors

Mumps is spread by direct contact with either saliva or droplets from the sneeze or cough of an infected person. The most infectious period for mumps is usually about two days before until four days after the onset of the illness, but someone with the disease can be contagious for up to seven days before until nine days after the swelling of the salivary gland. In someone who has been admitted to the hospital, standard and droplet precautions are needed. People who work in healthcare cannot work for five days.

People without symptoms can also pass on the disease. The time from contact with the virus to the development of symptoms is usually about 16 to 18 days, but can be longer.

Once an infection has run its course, a person is typically immune for life. Reinfection is possible but the ensuing infection tends to be mild.
Prevention

Control

To reduce the spread of disease, people with mumps should be excluded from child care, school or work until five days after the onset of swelling or until the swelling disappears (whichever is sooner).

Immunisation

There is a safe and effective vaccine for preventing mumps infection. Since the introduction of an effective mumps vaccine, there has been a marked decline in the number of cases of mumps.

The mumps vaccination is offered free of charge as part of a combined measles, mumps and rubella (MMR) vaccine.

The National Immunisation Program Schedule recommends immunisation against mumps at 12 months (first dose) and 18 months of age (second dose). To ensure protection against the disease, it is important that your child receives all recommended doses of the vaccine at the recommended times.

How it can affect fertility

Male fertility

At the very beginning of infection, the virus attacks the testes, destroying the testicular tissue and reducing androgen (main male hormone) production. About 30% of male adolescents with mumps will develop orchitis. Orchitis can be unilateral (one sided) or bilateral (both sided). Bilateral orchitis leads to oligospermia (low sperm count) and testicular atrophy (any reduction in testicular size).

Following mumps orchitis, sperm morphology (specific structural features) deterioration is a long-lasting effect.

Spermiogenesis (development of sperm from germ cells) was greatly disrupted in half of the patients. In many patients whose testes were not atrophied, poor fertility was found persistently. According to the observations, sperm morphology was the most influenced, of the characteristics that were studied, and sperm count might be the least affected.

Female fertility

Women may develop ovarian swelling but this does not increase the risk of infertility.

Prognosis
Unilateral orchitis develops in circa one third of post-pubertal male patients which are suffering from mumps. With bilateral inflammation there is a higher risk of gonadal atrophy but sterility is rare. Orchitis is uncommon in prepubertal boys.

Pregnant women with mumps face concerns beyond those of the general population. In some studies, mumps infection in early pregnancy has been linked with spontaneous abortion, with one study identifying a 27% rate of fetal death after first trimester mumps infection compared with 13% in a control group. A second, more recent study has not shown the same association between spontaneous abortion and mumps infection in early pregnancy. Mumps infection in pregnancy did not seem to have any relation to fetal congenital anomalies.

Death from mumps is very unusual. The disease is self-limiting, and general outcome is good, even if other organs are involved.

Find more about related issues

Diagnoses

Azoospermia
Complete absence of sperm in the ejaculate of a man.
Learn more at: www.fertilitypedia.org/therapy/diag/azoospermia

Hydrocele testis
An accumulation of clear fluid in the tunica vaginalis, the most internal of membranes containing a testicle.
Learn more at: www.fertilitypedia.org/therapy/diag/hydrocele-testis

Hypogonadism
A medical term which describes a diminished functional activity of the gonads – the testes and ovaries.
Learn more at: www.fertilitypedia.org/therapy/diag/hypogonadism

Orchitis
An inflammation of the testes, involving swelling and heavy pains.
Learn more at: www.fertilitypedia.org/therapy/diag/orchitis

Therapies

ICSI
A micromanipulative fertilization technique in which a single sperm is injected directly into an egg.
Learn more at: www.fertilitypedia.org/edu/therapies/icsi

TESE
Removal of a small portion of testicular tissue in order to extract a few viable sperm.
Learn more at: www.fertilitypedia.org/edu/therapies/tese
MESA
A microsurgical procedure to harvest sperm from the single epididymal tubule (epididymis), used in the case of obstructive azoospermia.
Learn more at: www.fertilitypedia.org/edu/therapies/mesa

PESA
Sperm aspiration procedure in which a needle is inserted into the epididymis in order to retrieve sperm.
Learn more at: www.fertilitypedia.org/edu/therapies/pesa

Micro TESE
Microsurgical method used to identify areas of sperm production within the testes with the aid of optical magnification.
Learn more at: www.fertilitypedia.org/edu/therapies/micro-tese

Gallery

Pic
Electron micrograph of the ribonucleoprotein of mumps virus.

Pic
A boy with unilateral parotid gland swelling.
A CT image of the neck reveals the swelling of the left parotid gland (arrows).

Sources

“Mumps was a common childhood viral disease, but widespread vaccination has now made it rare in developed countries. (https://www.boundless.com/physiology/textbooks/boundless-anatomy-and-physiology-textbook/the-digestive-system-23/digestive-system-diseases-disorders-injury-and-clinical-cases-228/mumps-1115-10347/)” —sourced from Boundless licensed under CC BY-SA 4.0

“Mumps (https://en.wikipedia.org/wiki/Mumps)” —sourced from Wikipedia licensed under CC BY-SA 3.0


“Mumps Virus: Modification of the Identify-Isolate-Inform Tool for Frontline Healthcare Providers (http://escholarship.org/uc/item/9z75b667#page-1)” —by Koenig et al. licensed under CC BY 4.0

“MUMPS (https://fertilitypedia.org/edu/diagnoses/mumps)” —sourced from Fertilitypedia.org licensed under CC BY-SA 4.0

“Mumps virus electron micrograph (https://en.wikipedia.org/wiki/Mumps_virus#/media/File:Mumps_virus_electron_micrograph.jpg)” —by Beards licensed under CC BY-SA 4.0

“Mumps (https://bacterialandviraldiseases.wikispaces.com/Mumps)” —sourced from Wikispaces licensed under CC BY-SA 3.0

“Mumps, Cervical Zoster, and Facial Paralysis: Coincidence or Association? (https://www.hindawi.com/journals/criot/2014/289687/)” —by Kondo et al. licensed under CC BY 3.0