



A REVIEW ARTICLE ON MUMPS DISEASE

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ABSTRACT

Mumps is a common childhood infection caused by the mumps virus. Mumps virus causes childhood disease that is characterised by swelling of the salivary glands [parotitis] and the testes [orchitis]. Other complications includes deafness and pancreatitis. Though it causes what is usually a mild disease infection, in adolescents and adults, it can be seriously uncomfortable and lead to meningitis and other sequelae. It was the main cause of viral meningitis before vaccine controlled the numbers of cases. Clinical diagnosis can be based on classic parotid swelling; however, this feature is not present in all cases of mumps and can also occur in various other disorders. Laboratory diagnosis is based on isolation of virus, detection of viral nucleic acid, or serological confirmation [generally presence of IgM mumps antibodies]. Mumps virus is a nonsegmented negative-stranded ribonucleic acid virus belonging to the family paramyxoviridae. Mumps is vaccine-preventable and one dose of mumps vaccine is about 80% effective against the disease. Routine vaccination has proven highly effective in reducing the incidence of mumps, and is presently used by most developed countries; however, there have been outbreaks of disease in vaccinated population. In 2005, a large epidemic peaked in the UK, and 2006 the American Midwest had several outbreaks. In both countries, the largest proportion of cases was in young adults.

KEYWORD: Mumps, Mumps virus; parotitis; paramyxovirus; RNA virus; orchitis; MMR vaccine.

Introduction to Mumps

Mumps is a transmittable disease caused by a virus.^[1] "The virus is extend through droplets of respiratory secretions, direct contact with infected fluids (saliva, urine), or fomites (objects capable of transmitting infection, such as utensils). It affect the salivary glands below the ear which is why the face appears inflamed. Mumps mostly affects kids, though there are cases where adults have contracted the disease."^[2]



Fig. 1: A viral infection that affects the salivary glands that's are easily preventable by a vaccine.

Causes

"Mumps is caused by a virus. This virus is an RNA (ribonucleic acid) virus from the family paramyxovirus

by the genus Rubelavirus. It only infects human, and is found worldwide."^[3]

Virology

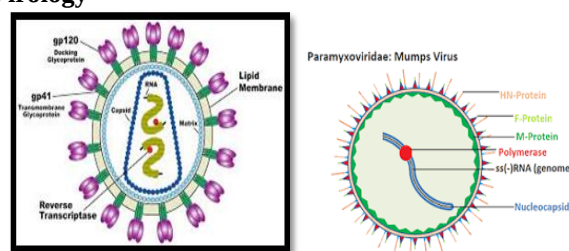


Fig. 2: Structure of Mumps Virus.

Symptoms

"Mumps usually causes inflammation of the glands under the ears or jaw (called 'parotitis').



Fig. 3: Symptoms.

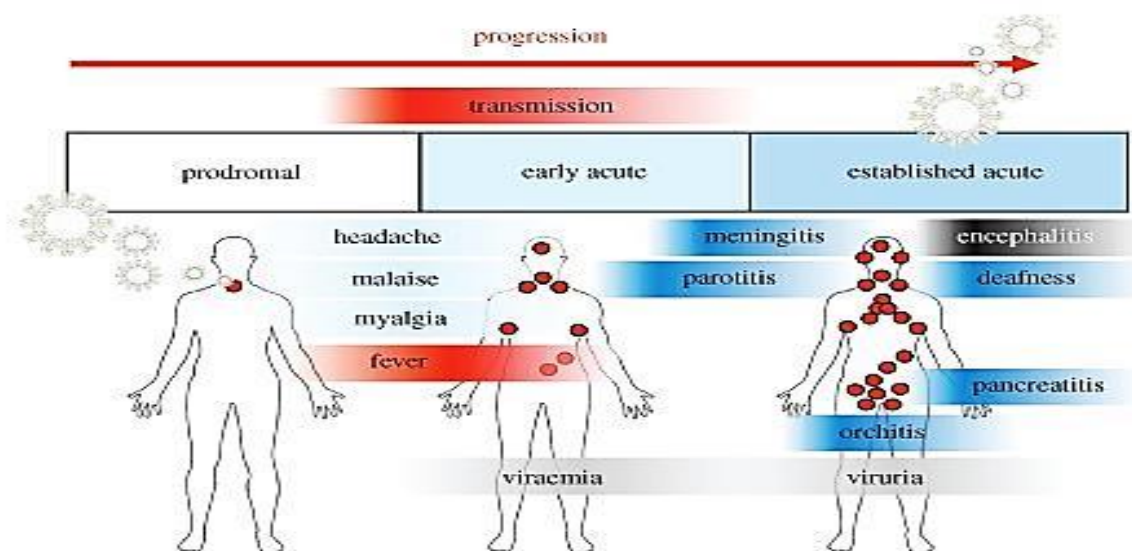
Other symptoms include

- 1) Fever.
- 2) Headache.
- 3) General aches and muscle pains.
- 4) Symptoms can last for 7 to 10 days. Some people with mumps may not have any symptoms. Others may feel unwell but not have swollen glands.”^[4]

Pathogenesis

“The virus is acquired by respiratory droplets. It replicates in the nasopharynx and regional lymph nodes. After 12 to 25 days a viremia occurs, which lasts from 3 to 5 days. for the duration of the viremia, the virus spreads to multiple tissues, including the meninges, and glands such as the salivary, pancreas, testes, and ovaries. Inflammation in infected tissues leads to characteristic symptoms of parotitis and aseptic meningitis.”^[5]

Transmission



“The virus replicates within the upper respiratory tract and is transmitted through contaminated respiratory droplets or saliva and fomites. The virus is isolated 7 days before and 9 days after parotid gland swelling, with the greatest transmission during the 7-day period beginning 2 days before the onset of parotitis. Asymptomatic patients may also shed the virus. The incubation period spans from 12 days up to a maximum of 25 days and is usually known to be 16-18 days. Since the infectivity of mumps is lower than that of measles, a significant number of persons pass through childhood without being infected with the mumps virus.”^{[8][9]}

Complications

“Orchitis (testicular inflammation) is the most common problem in postpubertal males. In the prevaccine era, orchitis was reported in 12% to 66% of postpubertal males infected with mumps. In 60% to 83% of males with mumps orchitis, only one testis was affected. With mumps-associated orchitis, there is usually sudden onset of testicular swelling, tenderness, nausea, vomiting, and fever. Pain and swelling may subside in 1 week, but

How Mumps Spreads

“The mumps virus is found in the saliva and fluids from the nose and throat of infected persons. It is spread when an infected person coughs or sneezes. Or shares food or drinks.

The most likely time that an infected person can transmit mumps to a non-infected person is from 3 days before symptoms appear to about 5 days after the symptoms appear.”^[6,7]

tenderness may last for weeks. Sterility from mumps orchitis, even bilateral orchitis, occurred infrequently. In U.S. outbreaks in 2006 and 2009–2010 (the postvaccine era), rates of orchitis among postpubertal males have ranged from 3.3% to 10%. Orchitis usually occurs after parotitis, but it may precede it, begin at the same time, or occur alone.”^{[10][11]}

The Complications associated with mumps in children are

“Encephalitis: This can occur when the virus causing the mumps travels to the brain and causes an infection there. The condition can be life-threatening. Your child may experience sudden intense headaches, may lose consciousness or even have seizures.

Pancreatitis: This is the inflammation of the pancreas that can result in cysts formation, damage to tissues, and bleeding of some glands. The condition is accompanied by nausea, vomiting, and upper abdominal pain.

Meningitis: if the virus travels to the nervous system and causes an inflammation of the membranes that protect the brain and spinal cord, it is said to be meningitis.

The symptoms associated with this condition are

1. Headaches
2. Fever
3. Muscle pain
4. Sensitive to light

Orchitis: This condition occurs in males after they have crossed puberty. It is marked with the swelling of one or both testicles.

Hearing loss: In very rare cases, the virus will affect the cochlea which is an integral part of the ear. Such a condition could result in loss of hearing and can sometimes be permanent.

Mumps can also cause an inflammation of the reproductive organs.”^[12]

Treatment of Mumps

“Due to the viral nature of mumps, treatment focuses on decreasing symptoms.

- a) Eat soft, bland foods that do not require much chewing. Examples include oatmeal, bananas, pasta, potatoes, eggs, gelatin, cooked vegetables, applesauce and tender cooked meats .keep away from tart drinks and sour foods since they can irritate the swelling and cause pain.eg
 - 1) Orange juice
 - 2) Salad dressing
 - 3) Pickles
- b) Use over-the-counter medication such as acetaminophen or ibuprofen to reduce fever and pain.
- c) Apply heat or cold packs to the cheeks. Some people find warm compresses to be more soothing while others from cold compresses provide more pain relief.
- d) If orchitis develops, treat this with bed rest, ice packs, and ibuprofen and provide support to inflamed testicles by wearing tight fitting underwear or an athletic supporter.
- e) Get extra rest and stay well hydrated with plenty of fluids such as water, Sprite, bouillon, milk and popsicles.”^[13]

Treatment of Mumps in a child

“There is no specific treatment for mumps. There are a few ways you can make sure that your child is comfortable as the disease runs its course:

1. Medical treatment

There will only include ibuprofen or acetaminophen to lessen any fever your baby may have.

- a) Give your child easy chewable foods like:
- b) Khichdi
- c) Yogurt
- d) Soup

This will make sure that your child gets the food they need without hurting their jaws.

e) Separate your child from other children .The disease is too contagious to allow any contact with other kids

f) This disease will make your child very tired. It is best to make sure that they stay in bed to recoup their strength.

g) You can use either a warm or cold compress on the swollen glands for some temporary relief. Do not use the compress for more than ten minutes at a time.”

2. Home remedies

a) Use Neem leaves. Neems leaves will not only reduce the swelling but will also help fight the virus. Make a paste with the leaves and some turmeric powder and apply on the swelling.



Fig. 4: Neem.

b) Ginger has anti-viral and anti-inflammatory properties. It is also an excellent pain reliever and either add this directly to your child's food or make a paste from the root and apply it on the swollen area.

c) Black pepper powder should be mixed with water and applied as a paste. This will help to alleviate the swelling.

d) A paste of asparagus and fenugreek seeds on the swelling will help tremendously. Fenugreek seeds have the same properties that ginger does.

e) Garlic paste applied on the swelling is a traditional approach to easing the pain.



Fig. 5: Aloe vera having antibiotic property.

f) Aloe vera is well known for its antibiotic properties and will help with the swelling. It is the one of the best remedies for mumps in children.

How long will it takes to cure

The inflammation in the glands takes about a week to go down. Normally, a child will take 10 to 12 days to recover from mumps.

Diagnosis and test for Mumps

Tests that your doctor may prescribe are

- 1) Serological or antibody testing: this test checks for the presence of IgG and IgM antibodies that are produced specifically when infected with mumps.
- 2) Viral genetic testing or RT-PCR: If your child has a weak immune system and cannot produce

antibodies, then this genetic test is the best option for a diagnosis.”^[14]

Prevention

“The best way to reduce the risk of contracting mumps is to be immunized with the mumps vaccine. This can be given in the combined measles, mumps, and rubella vaccine commonly referred to as MMR vaccine. The CDC (centers for disease control and prevention) recommends that all college students have two doses of the MMR vaccine, as two doses prevent approximately 90% of mumps cases. While receiving the vaccine is not a 100% guarantee against ever getting the mumps, it significantly reduces the risk.

Once your child has contracted mumps, they will gain immunity to the disease and will not have to worry about it again.

Vaccines



Fig. 5: The MMR vaccine will prevent mumps, measles, and rubella.

1. MMR Vaccine

- a) The MMR Vaccine is for measles, mumps and rubella. The first dose needs to be administered when your child is around 12 to 15 months of age.
- b) Second dose will be administered around the age of 4 and 6 or when they turn 11.
- c) If taken in two doses, the vaccination offers a protection rate of 95%.
- d) A single dose will be ineffective in a large outbreak in your child's school or neighboring.

Mumps Component of the MMR Vaccine	Recommended for all children over the age of one who do not have specific contraindications (immunocompromise)	Protection is life-long after a single dose although most people receive two dose as part of the MMR vaccine. The mumps vaccine has led to a 98% decline in mumps cases in the US since 1968.	Most person born before 1957 are likely to have been infected naturally by mumps virus and can generally be considered immune; otherwise, considersusceptible unless documented receipt of live mumps vaccine on or after the first birthday. Laboratory evidence of mumps immunity, or physician-diagnosed mumps disease.
Rubella Component of the MMR vaccine	Aims to prevent the congenital rubella syndrome by ensuring. that all women of child bearing age are protected against infection. Most persons born before 1957 can be considered immune.	A single dose confers life-long protection in 95% of vaccines. Because the live attenuated rubella virus can cross the placenta it is contraindication in all pregnant women and within 3 months of a planned conception.	Date on 226 women who received rubella vaccine during pregnancy or within three months of conception showed no evidence of congenital rubella syndrome.

If your child is infected by mumps, you can take several precautions to ensure that the infection does not spread to other children. Precautions are as under

- 1) Make sure that your child sneezes into tissues which must be properly disposed of. Give them a dustbin to throw the tissue in.
- 2) Ask your child to wash their hands carefully with soap several times a day.
- 3) Isolate your child from other children's.
- 4) Use a disinfectant to clean the surfaces that your child touches.

- 5) Do not allow members of your family to share utensils with your child.

Mumps Vaccine Characteristics

Mumps virus was isolated in 1945, and an inactivated vaccine was developed in 1948. This vaccine produced only short-lasting immunity and its use was discontinued in the mid-1970s. The currently used Jeryl Lynn strain of live attenuated mumps virus vaccine was licensed in December 1967. The vaccine was recommended for routine use in the United States in 1977.

Mumps vaccine is available combined with measles and rubella vaccines (as MMR), or combined with measles, rubella, and varicella vaccine as MMRV (ProQuad). Single-antigen mumps vaccine is not available in the United States.

Preparation of vaccine

Mumps vaccine is prepared in chick embryo fibroblast tissue culture. MMR and MMRV are supplied as a lyophilized (freeze-dried) powder and are reconstituted with sterile, preservative-free water. The vaccine contains small amounts of human albumin, neomycin, sorbitol, and gelatin.

Immunogenicity and Vaccine Efficacy

Mumps vaccine produces an inapparent, or mild, noncommunicable infection. Approximately 94% (89% to 97%) of recipients of a single dose develop measurable mumps antibody. Seroconversion rates are similar for single antigen mumps vaccine, MMR, and MMRV. Postlicensure studies determined that one dose of mumps or MMR vaccine was 78% (49% to 92%) effective. Two dose mumps vaccine effectiveness is 88% (66% to 95%).

Contraindications and Precautions to Vaccination

Contraindications for MMR and MMRV vaccines include history of anaphylactic reactions to neomycin, history of severe allergic reaction to any component of the vaccine, pregnancy, and immunosuppression.

In the past, persons with a history of anaphylactic reactions following egg ingestion were considered to be at increased risk of serious reactions after receipt of measles- or mumps-containing vaccines, which are produced in chick embryo fibroblasts. However, data suggest that most anaphylactic reactions to measles- and mumps-containing vaccines are not associated with hypersensitivity to egg antigens but to other components of the vaccines (such as gelatin). The risk for serious allergic reactions such as anaphylaxis following receipt of these vaccines by egg-allergic persons is extremely low, and skin-testing with vaccine is not predictive of allergic reaction to vaccination. As a result, MMR may be administered to egg-allergic children without prior routine skin-testing or the use of special protocols.

MMR vaccine does not contain penicillin. A history of penicillin allergy is not a contraindication to MMR vaccination.

Pregnant women should not receive mumps vaccine, although the risk is theoretical. There is no evidence that mumps vaccine virus causes fetal damage. Pregnancy should be avoided for 4 weeks after vaccination with MMR vaccine.

Mumps immunity

“Generally, person can be considered immune to mumps if they born before 1957 have serologic evidence of

mumps immunity or laboratory confirmation of disease, or have written documentation of adequate vaccination of mumps IgG antibody by any commonly used serologic assay in acceptable evidence of mumps immunity. Person who have an “equivocal” serologic test result should be considered susceptible to mumps.

For unvaccinated healthcare personnel born 1957 who lack laboratory evidence of measles, mumps and rubella immunity or laboratory confirmation of disease, healthcare facilities should consider vaccination with dose of MMR vaccine at the appropriate interval (for measles and mumps) and one dose (for rubella).

Postexposure Prophylaxis

Immune globulin (IG) is not effective postexposure prophylaxis. Vaccination after exposure is not harmful and may possibly avert later disease.”^{[15][16][17][18]}

MMR Vaccine side effects

“Most people given the MMR vaccine do not suffer side effects, and the disease itself cannot be contracted from the vaccine. A small %age might develop rash or fever and possibly aches in their joints .one in a million will suffer a severe allergic reaction from the MMR vaccine.”^[19]

CONCLUSION

Firstly prevention is important, and if the child is infected with mumps virus can be scary for the parents. But it is important to belief your physician and not fear. The virus is contagious it means it transmitted from one person to another person through touching ,sneezing, coughing etc, So contact the parents of other children who may have come in contact with your child during the days leading up to a diagnosed case of mumps. The chances of a child Recovering from mumps are very high if diagnosed and treated early. Pregnant women should not receive mumps vaccine, although the risk is theoretical. Pregnancy should be avoided for 4 weeks after vaccination with MMR vaccine.

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