



MUMPS: UNDERSTANDING THE VIRUS AND STAYING SAFE-CASE SERIES

Paediatrics

Tibu John Joyse	Post Graduate, Department Of Paediatrics Sri Siddhartha Medical College, Tumkur, Karnataka
Kumar G V	Professor And Head, Department Of Paediatrics Sri Siddhartha Medical College, Tumkur, Karnataka
Arun Kumar G	Assistant Professor, Department Of Paediatrics Sri Siddhartha Medical College, Tumkur, Karnataka
Kamolesh Kannan. R	Post Graduate, Department Of Paediatrics Sri Siddhartha Medical College, Tumkur, Karnataka

ABSTRACT

Mumps is an acute disease of children and young adults, caused by a paramyxovirus of which there is only a single serotype. The mumps virus is only known to infect humans.¹ With the implementation of widespread vaccination, the incidence of mumps in the population has decreased substantially. It is transmitted through direct touch or airborne droplets from infected people's upper respiratory tracts. Mumps is most commonly recorded in children between the ages of 5 and 9; however, adults and adolescents can also contract the illness. The mumps starts with non-specific symptoms such as myalgia, headache, malaise, and low-grade fever after an incubation period of about two to four weeks. Days after the onset of these symptoms, the parotid salivary glands expand unilaterally or bilaterally; in 10% of instances, other salivary glands are also affected.¹

KEYWORDS

Mumps, Mmr, Uip, lap

ETIOLOGY:

A single-stranded RNA paramyxovirus causes the mumps. The mumps virus is known to have only one serotype. The virus is replicated via nucleoprotein, phosphoprotein, and polymerase in conjunction with genomic RNA to generate the ribonucleocapsid. Ribonucleocapsid is surrounded by a lipid bilayer produced from the host. Viral neuraminidase and fusion proteins, which enable cell interaction and virus entrance, are contained within this lipid bilayer. The primary targets of antibodies that neutralize viruses are these fusion complexes. The virus is a stable virus that cannot merge. Risk factors for mumps include immunodeficiency, international travel and lack of vaccination.²

Pathophysiology:

The incubation time averages 16–18 days with a range of 12–25 days. Humans are the only natural hosts for viral mumps. Individuals are most contagious 1 to 2 days before the onset of symptoms. Primary replication occurs in upper airway mucosal epithelium. Infection of mononuclear cells in regional lymph nodes promotes viremia which leads to systemic inflammation in the salivary glands, testes, ovaries, pancreas, mammary glands, and the CNS.²

Clinical Features:

Direct contact with an infected person's saliva or droplet dissemination are the two ways that mumps is transferred. Patients are deemed contagious from two days prior to the beginning of parotitis to five days following it. A third or so of illnesses don't cause any symptoms. The characteristic of mumps is parotitis, which is often bilateral and affects 95% of people with symptoms. Usually, it starts unilaterally and, a few days later, the contralateral parotid gland becomes involved. Less frequently, other salivary glands are impacted. Prior to the beginning of parotitis, the majority of patients experience a brief prodrome of fever, malaise, anorexia, and headache. In 15% to 30% of postpubescent men, epididymo-orchitis is the most prevalent extrasalivary symptom. Orchitis appears four to eight days following parotitis and is bilateral in approximately 25% of cases. Although orchitis-related infertility is rare, 50% of patients may see a decrease in testicle size, and 25% may experience abnormal sperm test findings.

Oophoritis (5%), aseptic meningitis (1%–10%), temporary hearing loss (4.1%), and encephalitis (0.1%) are uncommon extrasalivary symptoms. Permanent hearing loss (0.005%) and death (1.5% of encephalitis cases) are rare.³

Case Presentation:

Between March and June 2024, a total of 7 cases of mumps were

identified with 40 unidentified cases from one of the schools of the child who presented to us. The age distribution of cases ranged from 3 to 10 years.

Distribution Of Cases Was As Follows:

Age(years)	Number of cases
3 years	2
5 years	1
7 years	1
9 years	2
10 years	1

Sex Distribution Of The Cases:

Sex	Number of cases
Male	5
Female	2

Clinical Presentation:

All the 7 cases (100%) presented with fever. 4 cases (57%) presented with constitutional symptoms (headache, myalgia, or fatigue). All the 7 cases (100%) presented with swelling of parotid glands.

1 case (14%) presented with unilateral parotid swelling and the remaining 6 cases (86%) presented with bilateral parotid swelling 3 cases (42.8%) presented with cough and cold.



Evaluation:

A mumps infection is confirmed by laboratory testing and clinical observation. Orchitis and parotitis are not always present in mumps cases, and people can present in different ways. When there is a history of exposure and parotid edema, the diagnosis is clinical during an outbreak. However, other infectious and non-infectious causes of parotitis should be looked into when the local incidence is low.

Laboratory confirmation methods for mumps include serum immunoglobulin M (IgM) antibodies and reverse transcriptase-polymerase chain reaction (RT-PCR). A buccal or oral swab for RT-PCR and an acute-phase serum specimen for IgM and IgG antibodies should be obtained by the treating doctor when a patient first presents with a suspected mumps infection. Buccal specimens should ideally be collected no later than eight days following the onset of symptoms and no later than three days after parotid gland swelling. The quality of the specimen can be enhanced by massaging the parotid gland 30 seconds prior to buccal swab collection. In both vaccinated and unvaccinated individuals, the IgM response may not be apparent for up to five days following the onset of symptoms.

Clinicians treating patients with suspected or confirmed mumps should notify their local or state health authority according to their state's public health laws and regulations.²

Treatment:

Most people with mumps recover completely within 2 weeks. No effective antiviral therapy for mumps exists; symptomatic measures are primarily supportive care and analgesics to relieve pain and fever. ¹As mumps treatment is symptomatic rather than curative, vaccination campaigns against the disease are the most effective way to avoid problems. Patients with mumps who have received at least one dose of the vaccine are generally 50% less likely to be admitted to the hospital with the illness or with complications, and a group of male patients with mumps showed that those who had previously received the vaccine had a nearly 70% lower risk of developing orchitis. Those who have received two doses of the vaccination have a 63% lower chance of needing to be admitted to the hospital due to the illness. ⁴

Current Situation Of Mumps In India:

India reported 764 mumps cases during 2021 and 2022, according to the Global Health Observatory (GHO) data source, showing a significant mumps burden, with children being disproportionately affected.

Prior spikes in mumps occurrences have raised worries among parents, legislators, healthcare providers, and government organizations. A thorough grasp of regional differences in disease dynamics, vaccination coverage, and healthcare facilities is essential given the rising incidence of mumps in India.

A worrying trend is the increase in mumps cases among kids in Rajasthan, Odisha, Uttar Pradesh, and Maharashtra. There are concerns regarding the mechanisms for the disease to resurface in these areas given that this rise was noticed four to five years later. Mumps outbreaks in Idukki and Palakad, Kerala; Sivagangai, Tamilnadu; Udipi, Karnataka; and Rajnandgaon, Chhattisgarh, in October and November of 2023, provided as sobering reminders of the difficulties presented by this contagious illness.

Children made up the majority of the cases, which first manifested as moderate fever and edema. District Rapid Response Teams spearheaded a multipronged response to these outbreaks that included more inoculation sessions, house-to-house surveys, and community awareness efforts.⁵

Factors Affecting Mumps Resurgence:

There are a number of potential causes for the current increase in mumps incidence in India. The mumps vaccine is not a part of the standard immunizations administered by India's Universal Immunization Programme (UIP), in spite of the World Health Organization's recommendations. The MR vaccine, which covers measles and rubella but not mumps, is given to children in India in two doses between the ages of 9 and 15 months. The MMR vaccine is only accessible in India's private sector and is still out of reach for more than 80% of the nation's children.

Prior to the introduction of vaccination, mumps was an epidemic disease with a cycle of 4-5 years. This is one of the main reasons for the recurrence of mumps in India, which has a largely naive child population because of the lack of a mumps component in UIP. There is a notable yearly decline in immunity for the mumps component among those who have had the MMR vaccine, according to a metaanalysis done to evaluate immunogenicity and fading rate estimates for the measles, mumps, and rubella components of the vaccine. The differences between the circulating and vaccine strains may be a significant factor in the vaccinated individuals' declining immunity.

Furthermore, in some areas, poor sanitation, congestion, and difficult access to medical services could all contribute to the virus's quick spread.⁵

Measures To Be Taken:

A potential corrective action that is also supported by extensive research on mumps-containing vaccinations in India is the addition of the MMR (Measles, Mumps, Rubella) vaccine to the universal immunization program (UIP) in lieu of the MR (Measles, Rubella) vaccine. The success of the domestically made MMR vaccine was highlighted by longitudinal follow-up studies that showed strong seropositivity for mumps-specific antibodies even after 6 years of immunization, as well as outstanding immunogenicity and low reactogenicity of the mumps component. Nonetheless, it is emphasized that two vaccination doses are required to sufficiently increase the number of circulating antibodies. In outbreak situations, giving children who had a longer time after immunization, the third dose of MMR proved to be beneficial.

Despite certain obstacles, such low seropositivity in certain studies, which highlight the value of extensive research, the majority of the data points to the MMR vaccine's inclusion in India's UIP as a means of reducing the incidence of mumps and its related consequences. Both the Indian Academy of Pediatrics (IAP) and the World Health Organization (WHO) acknowledge the MMR vaccine as a very successful method of preventing mumps, and the IAP incorporates it into its childhood and adolescent vaccination schedule. Recent mumps outbreaks in several Indian regions further highlight the importance of having a strong healthcare system that can quickly detect, isolate, treat, and keeping infectious illnesses at bay. In order to control re-emerging infectious illnesses like the mumps, public health initiatives can be guided by timely data obtained from surveillance system investments. The National Centre for Disease Control, Ministry of Health and Family Welfare, Government of India, oversees the Integrated Disease Surveillance Programme (IDSP), an infectious disease surveillance system that is primarily used for mumps surveillance. However, mumps is not on the list of diseases that need to be reported, and IDSP only presently tracks outbreaks of the disease.

Health education and public awareness campaigns are essential to limiting the mumps outbreak. Not every parent may be completely aware of the path of Mumps transmission and the value of immunizations. Myths should be dispelled with focused health education.

India can gain from international cooperation and take note of other nations' effective mumps outbreak containment strategies. For instance, Israel implemented a thorough ring vaccination program to stop the spread of mumps among its military and civilian populations during epidemics. A more successful reaction may result from exchanging research results, best practices, and vaccination delivery methods. Working together with global health organizations can also make it easier to acquire the vaccines and other supplies needed to fully contain the outbreak.⁵

CONCLUSION:

The recent mumps outbreaks that have been reported from various regions of India serve as a reminder that the mumps vaccine should be included in UIP in addition to boosting the surveillance system and creating a robust healthcare system.

Additional Information: The first author of this case series and few of his colleagues also suffered from mumps contracted from the children who presented to us. The doctors presented with bilateral parotid swelling. One of the treating doctors developed orchitis and was admitted on an emergency basis.

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