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RESURGENCE OF MUMPS IN CHILDREN, EXPERIENCE FROM A TERTIARY CARE HOSPITAL IN NORTH INDIA: IS IT THE HIGH TIME TO INTRODUCE MUMPS VACCINE IN NATIONAL IMMUNIZATION PROGRAMME?

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ABSTRACT

Introduction: India has witnessed a substantial increase in the number of mumps cases, primarily affecting children, in the 2023-24 [1]. The resurgence of mumps is challenging to our healthcare infrastructure and demanding swift, coordinated efforts to curb its spread and mitigate its impact on the vulnerable population, particularly children.

Aims and objectives: To identify all cases of measles reporting to hospital and find associated complications.

Material and methods: A hospital based prospective study was carried out in a tertiary care hospital of north India from November 2023 to September 2024. World Health Organization (WHO) clinical case definition used to identify clinically all the cases of mumps. The peadiatric patients reported to the hospital up-to age of 16years were included in the study. The details of cases which were recorded included demographic information, clinical features, immunization status, investigations, complications and any need for hospitalization.

Results: A total of 547 children with clinical case of mumps were included in the study. there were 66.7%(n=365) boys and 33.2%(n=182) girls. Their age ranged from 2 year to 16 years and median age was 9 years. Fever and parotid swelling were the two common presentations. Unilateral parotid swelling was more common than bilateral swelling seen in 48.9% (n=268) and 51% (n=279) number of children respectively.74.7% (n=409) children had received MR vaccine, 2.37%(n=13) subjects received MMR vaccine either one or two doses, none had received three doses of MMR and 13.6%(n=74) children were un-immunized. Majority got admitted because of pain abdomen, vomiting and dehydration accounting for 72.3% (n=396). CNS complications like meningitis and meaning encephalitis, were the second common reason for hospitalization with 3.83% (n=21) study subjects.

Conclusion: Mumps is still posing a significant health burden. There is need to strengthen the available mechanisms to improve disease surveillance and collect relevant data pan India and rethink about introducing MMR vaccine in National Immunization Programme.

KEYWORDS: *Mumps, MMR vaccine, National immunization Schedule*

Introduction

India has witnessed a substantial increase in the number of mumps cases, primarily affecting children, in the 2023-24 [1]. The resurgence of mumps is challenging to our healthcare infrastructure and demanding swift, coordinated efforts to curb its spread and mitigate its impact on the vulnerable population, particularly children. As per Global Health Observatory (GHO) data repository, India reported 764 mumps cases between 2021-22, indicating a substantial burden of mumps, particularly affecting children [2]. Previous surges in mumps cases have triggered heightened concerns among government agencies, healthcare professionals, policymakers, and parents alike [3]. Despite the recommendations of the World Health Organization [4], the Universal Immunization Programme (UIP) of India does not include mumps vaccine in the routine immunization. In India, children are offered the MR vaccine in a two-dose strategy for children at 9 and 15 months to cover measles and rubella but not mumps [5]. MMR vaccine is only available in the private sector in India and remains out of bounds for over 80% of the children of the country [6]. Additionally, overcrowding, inadequate sanitation, and limited and remote access to healthcare facilities in certain regions may facilitate the rapid spread of the virus [7].

Mumps is an acute, highly contagious viral infection caused by a single-stranded RNA paramyxovirus primarily affecting the salivary glands, particularly the parotid glands located beneath the ears, and characterized by its sudden onset with associated inflammation [8]. It spreads through respiratory droplets from coughing or sneezing of infected individuals, and complications may arise, like meningitis, encephalitis inflammation of the testicles or ovaries, pancreatitis, and deafness [9]. Even though mumps virus has only one sero- type known, there are 13 genotypes (A to M) of these viruses, which have been determined based on SH protein sequencing that is the most variable proteins among mumps strain viruses [10].

Subjects and Method: A hospital based prospective study was carried out in a tertiary care hospital of north India from November 2023 to September 2024. For the purpose of the study, according to the World Health Organization (WHO) clinical case definition, a case of mumps was defined as "any person who had acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting two or more days and without other apparent cause."[11] Patients were classified as clinical mumps cases due to unavailability of laboratory facilities in the region to isolate the mumps virus or demonstrate antibody levels. The pediatric patients reported to the hospital up-to age of 16years were included in the study. The details of cases which were recorded included demographic information, clinical features, immunization status, investigations, complications and any need for hospitalization. All the collected data was recorded in Microsoft excel and analyzed using SPSS v23. Categorical variables were described as frequencies and percentages.

Results: A total of 547 children with clinical case of mumps were included in the study. As this study was commenced in November 2023, but case of mumps were being reported earlier also so retrospectively data was also collected from the hospital records and it came into light that patients with mumps were reporting to the health system since June 2023 and number of case reported were 246 retrospectively and new patients were enrolled into study daily till September. Among study subjects there were 66.7%(n=365) boys and 33.2%(n=182) girls. Their age ranged from 2 year to 16 years and median age was 9 years. Fever and parotid swelling were the two common presentations. Parotid swelling was present in all subjects and fever was present in 88.8% (n=486). Unilateral parotid swelling was more common than bilateral swelling seen in 48.9% (n=268) and 51% (n=279) number of children respectively (Table 1).There was clustering of case in family, in 38.9 % (n=213) children there was history of mumps in other siblings also. Immunization records revealed that 74.7% (n=409) children had received MR vaccine as per National Immunization Programme, 2.37%(n=13) subjects received MMR vaccine either one or two doses, none had received three doses of MMR and 13.6%(n=74) children were un-immunized. Among the hospitalized children majority got admitted because of pain abdomen, vomiting and dehydration accounting for 72.3% (n=396). CNS

complications like meningitis and meaning encephalitis, were the second common reason for hospitalization with 3.83% (n=21). 17cases were of aseptic meningitis and 4 were meningoencephalitis Diagnosis of aseptic meningitis and mumps meningitis or meningoencephalitis was made on history of mumps and CSF examination, no PCR for mumps was done due to nonavailability of this test. Two cases were of encephalitis admitted in PICU, out of which one survived and other expired. Five adolescent boys of age 12 and 14 years developed orchitis after 2 weeks of parotid swelling.

Table 1

Clinical presentation	**N (%)**
Fever	486(88.8%)
Constitutional symptoms (headache, myalgia or fatigue	328(60%)
Parotid swelling	547(100%)
Unilateral	268(48.9%)
Bilateral	279(51%)
Cough and cold	459(83.9%)
Difficulty in swallowing	410(75%)
Meningoencephalitis	21(3.83%)
Scrotal swelling	5(0.91%)
Pain abdomen and vomiting	396(72.3%)

Discussion: Mumps is a viral infection, which spreads by inhalation of infected droplets of by fomites. Once infected virus replicates in the epithelium of upper respiratory tract and regional lymph nodes viremia occurs about 2-3 weeks later, during which virus spreads to various parts of body, particularly meninges and salivary glands. Mumps outbreaks are known to occur periodically, with intervals of 5-10 years. The median age of children were 9 years in our study which is the usual age reported previously. [10-13] Male preponderance was consistent with studies like Raut et al [14], Gupta et al, [15] Bernard H et al. [16] Like the natural course of disease, bilateral swelling of parotid is common presentation, [10-13] in our study we have unilateral swelling of parotid gland in 48.9% and bilateral swelling in 51% of study subjects. Systemic features including fever was present in 88.8% of patients, as many other research studies reported fever in 70 to 100% of patients. [10-13] Constitutional symptoms like headache, myalgia or fatigue were seen in 328 patients (60%). Cough and dysphagia were seen in 459 (84%) and 410 (75%) of the patients respectively. Our findings were similar to studies done by Moghe et al [10] and Arshad et al. [17] Encephalitis, meningitis, deafness orchitis (among post-pubertal men), and oophoritis (among post-pubertal females) are common complications. Aseptic meningitis and Meningoencephalitis reported in our study were 3.83%(n=21). Epididymo-orchitis is second complication in post pubertal males in our study. Majority of patients in our study had received MR vaccine, or they did not completed MMR vaccine schedule or were un-immunized, this finding reinforces that vaccine definitely has role in prevention of mumps and its complications, therefore decreasing the morbidity associated with this communicable disease. Primary mode of prevention is by use of mumps vaccine. It is a live attenuated vaccine containing Jeryl -Lynn or Leningrad-Zagreb stain and is given subcutaneously. Currently mumps vaccine is available only in the private sector. Indian Academy of Pediatrics (IAP) recommends MMR vaccine

between 9 months and 15 months 'age and another third dose at 4-6years.[18] MR vaccine is widely used in the country in a two-dose schedule for measles elimination. Inclusion of mumps vaccine will result in a two-dose schedule of MMR vaccine.

As we all know vaccine is available there, regarding effectiveness of the available vaccine it has been documented that the Jeryl Lynn stain containing vaccine was found to be effective 72% and 86% after first and second dose respectively. It was also found to prevent secondary attack rate by 74%.[19]

This is only the tip of the iceberg, actual disease burden is much more than this, as it is a single centered study and many of the patients with mumps are managed only on OPD basis. Other than vaccination, one of the prerequisites of a successful disease prevention and control program is a robust surveillance system. Mumps-related disease burden data in India continue to be sketchy. If mumps is to be controlled, it is essential to detect the cases that occur, investigate, and report them.

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