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Editorial

Does India Need to Rethink the Inclusion of the MMR (Measles, Mumps, and Rubella) Vaccine in the National Immunization Schedule?

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I N F O

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E D I T O R I A L

Mumps is an acute infectious disease caused by an RNA virus classified under the genus Rubulavirus of the family Paramyxoviridae. This virus has a preference for glandular and nervous tissues. Mostly children in the age group of 5–9 years are affected. It can involve older age groups also but as age advances, this disease becomes more severe. In this disease, both clinical and subclinical cases exist. Subclinical cases account for 30–40% of all cases.

The most common presentation in children is pain and swelling in either one or both sides of the parotid glands. The child has puffy cheeks and a tender jaw. Sometimes, the child can also complain of earache on the affected side before the onset of swelling. In advanced cases, it can also affect sublingual and submandibular glands. In severe cases, the child might present with fever, headache, and other constitutional symptoms. The parotid swelling subsides slowly over 1–2 weeks.

Complications such as orchitis, ovaritis, pancreatitis, meningoencephalitis, thyroiditis, neuritis, hepatitis, and myocarditis may develop in some cases. Up to 15% of mumps patients may develop meningitis and in rare cases, it can cause sensorineural deafness, facial palsy, polyarthritis, hydrocephalous, etc. Mumps infection during pregnancy is very serious. If infection occurs during the first trimester of pregnancy, it can result in spontaneous abortions in nearly 25% of cases.[1]

Current Status of Mumps Worldwide and in India

Mumps, a vaccine-preventable childhood disease, is highly infectious with secondary attack rates as high as 86%.[2] There is a high burden (100–1000 cases/100,000 population) of mumps in countries that do not offer mumps vaccination with epidemic peaks every 2 to 5 years.[2] Burden is perhaps higher, as 30% to 40% of cases may be asymptomatic.[3]

In India, although mumps is not a disease under surveillance in the Integrated Disease Surveillance Program (IDSP) on Integrated Health Information Portal (IHIP), health facilities can report suspected, probable, or laboratory-confirmed mumps cases or deaths to IDSP under the "other diseases" category.

Mumps resulted in many outbreaks in India. According to the IDSP and IAP-web-based network, between September 2009 and May 2015, 2892 mumps cases were reported.[3] Between July and September 2017, IDSP documented 15 outbreaks and 260 cases of mumps within the region.[4] Mumps is a significant public health concern in India, yet insufficient data from various regions underestimate its actual burden.[4,5]

As per the Global Health Observatory (GHO) data repository, India reported 764 mumps cases between 2021–22, indicating a significant burden of mumps, particularly affecting children.[6] In recent times, India has been suffering from several outbreaks in geographically diverse regions.[7,8] The most recent outbreak was in Kerala in March where 2505 cases were reported.[8] The reasons behind such outbreaks could be - a) the cyclical trend of mumps occurring every 3–4 years, b) its high communicability, c) non-immunised children, and d) poor social and environmental conditions.[9,10]

The disease burden can be better estimated if the mumps becomes a notifiable disease and is included in routine surveillance under IDSP. This recommendation is consistent with the recommendations of other researchers in India.[11,12] More outbreaks need to be investigated to understand the epidemiology of mumps in India and to guide its preventive strategies.

Preventive Strategies

Previously under the Universal Immunization Program (UIP), administration of Measles, Mumps, and Rubella (MMR) vaccination was carried out in selected states like Delhi. It is a known fact that the most effective means of reducing the risk of contracting mumps is through vaccination administered as part of the MMR vaccine.[13] Research suggests that the mumps-containing vaccine effectively induces seroconversion in vaccinated individuals; however, administering two doses of the vaccine is essential to enhance the presence of circulating antibodies. The protective efficacies of mumps antibodies after the first and second doses of the MMR vaccine are 78% (49–91%) and 88% (66–95%), respectively.[14]

However, the Government of India (GoI) has announced its decision to include the rubella vaccine in the form of a bivalent Measles-Rubella (MR) vaccine in its Universal Immunization Program (UIP).[15] The two-dose MR vaccine shall be provided at 9 months in place of the stand-alone measles vaccine, and at 16–24 months along with the first booster of the Diphtheria-Tetanus-Pertussis (DTP) vaccine.[16] The main reasons why GoI has not considered mumps for inclusion in the National Immunization Program are: a) the disease is not considered a serious public health issue, b) lack of published data on the community burden of mumps, and c) lastly the higher cost of the MMR vaccine in comparison to MR vaccine.[3] However, this is not the fact rather many outbreaks of mumps have been witnessed.

The replacement of the MR (Measles, Rubella) vaccine with the MMR vaccine within the national immunization schedule (NIS) is suggested as a prospective remedial action, supported by extensive research on mumps-containing vaccines conducted in India.[16,17]

In case-control studies, a mumps-containing vaccine (MuCV) demonstrated vaccine effectiveness of 68%. In cohort studies and randomised control trials, the vaccine efficacy was 58%. In the non-outbreak period, the vaccine efficacy was better than in the outbreak period.[18,19] Such efficacy is acceptable while keeping the minimum side effects.

Mumps appears to pose a notable public health challenge in India, yet it often goes unnoticed due to the lack of a robust surveillance and documentation system. Also, it is still not a notifiable disease. The Indian Academy of Pediatrics (IAP) has argued very strongly for the inclusion of the MMR vaccine instead of the MR vaccine because the children may get extra protection using the same logistics and operational feasibility. The use of the MR vaccine in place of the MMR vaccine is considered a 'missed opportunity' to target a significant VPD that also has a significant impact on child health.

Way Forward

Integrating the mumps antigen into the National Immunization Schedule would offer several benefits, with the economic burden of vaccine costs mitigated by a decrease in the disease burden.[20] When administering MMR vaccines, the protective immune response to each of their components remains consistent. A sizable cohort of births might not benefit from the vaccine if its inclusion is delayed. Guaranteeing vaccine security, which entails ensuring a consistent supply of quality vaccines at an affordable price, requires robust collaboration with industry partners and accurate forecasting of vaccine supplies.[21]

The economic evaluation conducted in the United States revealed that implementing a two-dose MMR vaccination

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program resulted in cost savings from both direct cost and societal perspectives. The net savings (net present value) from direct cost and societal perspectives were approximately $3.5 billion and $7.6 billion, respectively.[22] However, there is insufficient evidence to support the cost-effectiveness of the MMR vaccine in India. Given the urgent need for mumps vaccination, studies addressing this issue must be undertaken. However, from the public health point of view, the incremental cost of adding a mumps component to the MR vaccine would be minimal and could be cost-effective.

Conclusion

In light of recent outbreaks and epidemiological trends, widespread implementation of the MMR vaccine has to be advocated. There is an urgent need to rethink to include mumps in the National Immunisation Schedule. Just because of the lack of proper documents and studies in India when such evidence is already available elsewhere in the world, we cannot neglect one of the major vaccine-preventable diseases, for which an effective vaccine exists. By ensuring access to and promoting the uptake of the MMR vaccine, we can effectively mitigate the risk of mumps outbreaks, safeguard public health, and foster a healthier future for all individuals across the nation.

Conflict of Interest: None

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