

## AN EXPLORATION OF THE FEASIBILITY OF INTRODUCING ROTA VACCINE INTO THE ROUTINE EPI SCHEDULE OF BANGLADESH

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### INTRODUCTION

Rotavirus is the most common cause for Rotavirus-Induced Acute Gastroenteritis (RVGE) among the young infants in the developing countries. RVGE is a form of acute watery diarrhoea, which causes severe dehydration and ultimately can lead to death if untreated or poorly managed.<sup>1</sup> It is estimated that 2.4 million cases of rotavirus diarrhoea occur annually in Bangladesh among children under 5 following about 3000 deaths. At icddr,b hospital (a Bangladeshi research based international organization) about 40,000 hospitalizations occurs each year for RVGE that represents about 15% of community cases. Immunization against rotavirus can increase the infant survival to make a positive change in near future. World Health Organization (WHO) has already recommended the inclusion of

Rotavirus (RV) vaccine in the routine immunization. Globally more than 130 countries have already licensed RV vaccine, and 80 have integrated the RV vaccine within National Immunization Programme (NIP).<sup>2</sup> Currently, there is no available RV vaccine under the NIP in Bangladesh.

### EXISTING TREATMENT STRATEGY OF ROTAVIRUS

There is no particular treatment against rotavirus except supportive treatment which mostly focus on rehydration regimen. However, provision of intravenous fluid is not available in the rural facilities due to difficulty in performing intravenous cannulation. Antibiotics are not effective in treating viral diseases like Rota; rather clinicians depend on supportive treatment focusing

on the introduction of rehydration regimen. However for the severely dehydrated child, provision of special settings equipped with intravenous facilities are a must need to administer prompt treatment. However, provision of intravenous (I/V) fluid is not available in the rural facilities as the process of intravenous cannulation is challenging and it needs a skilled hand to operate the procedure. When severe dehydrated patients are referred from community to the sub-district hospital, it causes treatment delays. Counting every delay is a risk for adverse consequences, the sick infants can experience hypovolemic shock due to severe dehydration.

#### **INTEGRATION OF RV VACCINE IN NATIONAL IMMUNIZATION PROGRAMME**

Rotavirus vaccine provides about 45% efficacy and effectiveness in Bangladesh. Integration of RV vaccine into the EPI schedule of Bangladesh is feasible, as Bangladesh applied to GAVI, the Vaccine Alliance in Sep 2016 for RV vaccine support and it got approval in November 2016. The implementation of RV vaccine will be more cost-effective, convenient and it will also decrease the risk of avoiding the missed opportunities to get the RV vaccine coverage. There is substantial evidence that RV vaccine can be used concurrently with OPV and PENTA vaccine and the RV is well accepted in the community.<sup>3</sup> At present two RV vaccines are available globally which showed high efficacy of clinical trial in different settings. Rotarix (GlaxoSmithKline) and RotaTeq (Merck) are the monovalent and pentavalent oral vaccine, respectively, that are being used in other countries for the last couple of years. Both vaccines can be given in oral dose, and it needs to start from 6 weeks of age. However, Rotarix follows two dosage vaccine schedule

whereas Rota Teq requires three doses.<sup>4</sup> Considering the introduction of RV vaccine in Bangladesh, limited cold space has been identified as the most significant barrier. The country may need to undergo a large procurement of the logistics, and it requires a substantial budget. Generation of knowledge regarding vaccine physiology and how to deal with the possible vaccine-related complications among the health workers are required. However, donors like GAVI, WHO and UNICEF can give the financial support and technical assistance throughout the training period during the capacity build-up phase.

#### **EXPECTED OUTCOME FOR INTRODUCING ROTA VACCINE (RV)**

Rota Virus vaccine can prevent about 135,000 hospitalizations per year due to severe rotavirus diarrhoea in Bangladesh. The demand of getting the RV vaccine within the NIP is high among the people and health professionals. Moreover, children will be offered to take the RV dose during the routine EPI practices without any extra clinic visit.<sup>3</sup> Health campaign for RV vaccine through electronic and print media can increase the demand for vaccine among the community people. Adverse Event Following Immunization (AEFI) is an emergency situation which usually occurs after the first time introduction of the vaccine in immunization system. AEFI monitoring and continuation of support to carry out surveillance is crucial for any new vaccine orientation into EIP.<sup>5</sup> The prior planning needs to be established to avoid any unintended situation during vaccination programme. However, the occurrence of severe adverse events (intussusception, Kawasaki disease, and severe allergic reactions) are very rare. Active case finding of AEFI needs to be carried out by the help of the parents of children, health

workers both from government and NGO side using the sentinel sites correctly.

### **VACCINE PROMOTION AND RESPONSE TO VACCINE-RELATED ADVERSE EVENTS**

Maintaining a hierarchical reporting system from field level to EPI headquarter is required during the initial phase of implementation. Any report of negligence or programmatic error due to a technical fault or due to inefficiency with the cold chain needs to be reported urgently to identify the root problem. A dedicated Rota team needs to be appointed, and they will be responsible for undertaking appropriate action to minimize further programme errors after consulting with vaccine experts. The RV vaccine clinical trial conducted in Bangladesh showed significant potential in reducing the incidence of severe RVGE by halves. Therefore, inclusion of RV vaccine within the NIP for the Government of Bangladesh will be one of the significant commitments to combat vaccine-preventable diseases for the people.

### **CONCLUSION**

Rotavirus vaccine has the potential to be considered as the most cost-effective public health intervention in developing countries to reduce diarrhoea-related mortality and morbidity. Rotavirus vaccines should be a part of the comprehensive strategy of all developing countries like Bangladesh. Before RV vaccine introduction, a series of feasibility assessment and gap identification is required. The high burden of rotavirus disease in Bangladesh requires a powerful response which can be provided by introducing the rotavirus vaccine in the EPI schedule. It would be a new milestone

towards achieving universal immunization to save children's lives.

*Conflict of Interest: The authors declare that there is no conflict of Interest.*

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