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Strategies to Combat Congenital Rubella Syndrome: An Overview

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Abstract

Congenital Rubella Syndrome affects nearly 110000 infants every year and is one of the most important preventable causes of congenital anomalies in children. The Measles Rubella Initiative along with its partners has chalked out a Global Strategic Plan to combat rubella along with measles and aims to eliminate both the diseases by 2020 in at least five WHO Regions. India is also committed to eliminating Rubella by 2020 and has laid down steps to combat this disease.

Keywords: Congenital Rubella Syndrome; Rubella-Containing Vaccines (RCV); Measles and Rubella (MR); Measles; Mumps and Rubella (MMR).

Introduction

Rubella is a viral exanthematous self-limiting illness caused by an RNA virus of the Togaviridae family [1]. However, when the virus affects a pregnant woman, then it leads to a transplacental infection of the foetus which results in a conglomeration of defects in the newborn referred to as Congenital Rubella Syndrome (CRS) [2]. CRS results in an array of defects of the eyes, ear, heart and other organs resulting in morbidity and disability that would require costly therapy and lifelong care [3]. In the year 2008, it was found that 110000 infants were affected by CRS and nearly 48% of them were from South East Asian region, and another 38% were from the African region [4].

The exact estimate of the burden of CRS in India is not available. Dewan P et al. did a systematic review of Congenital Rubella Syndrome and found that most of the data available were from hospital-based studies and community-based data was lacking [5]. Few serosurveys to check for the levels of rubella antibody have been done in different parts of India. Ramamurthy et al. did a study among boys and girls of Tamil Nadu and found seronegativity of 82.2% among the children of 1-5 years and 13.2% of the adolescent boys and girls (10-16 years) [6]. Sharma et al. studied the serostatus for rubella in two public schools in Jammu among school girls aged 11-18 years and found 32.7% seronegativity among them [7]. Vijayalakshmi et al. did serosurveys in three cities of Tamil Nadu and found seronegativity ranging from 11.7-20.8% [8].

Why Focus on Rubella Elimination?

Though rubella is a self-limiting disease in children, the real problem occurs when the disease affects pregnant women. Congenital Rubella Syndrome is one of the most common causes of avoidable congenital anomalies in infants, as effective vaccines are available to prevent rubella infections [4]. Rubella vaccines could be monovalent or in combination with other vaccine viruses called Rubella-containing vaccines (RCV) like Measles and Rubella (MR), Measles, Mumps and Rubella (MMR), etc. Most of the Rubella vaccines use a live attenuated strain RA 27/3 [9]. All licenced serovaccines for Rubella cause a 95% seroconversion rate after administration of a single dose and the protection lasts for 10-21 years [10].

Strategic Advisory Group of Experts on Immunisation (SAGE) Recommendations for Rubella Vaccine

The SAGE reported that as of 2011, 63 of the 194 WHO member states had not introduced rubella-containing vaccine into their routine immunisation schedule. SAGE had indicated that there were two approaches to introducing rubella containing vaccines. One is to vaccinate all adolescent girls/

women of childbearing age with RCV. This would prevent congenital rubella syndrome but will not reduce the transmission of rubella infection. The other approach is to introduce the vaccine into the childhood immunisation schedule replacing the two doses of measles-containing vaccine with MR or MMR. But before this is done a wide age range campaign with rubella-containing vaccine should be done and then MR/ MMR should be introduced within six months. This strategy, in the long run, would help in the elimination of measles. But care should be taken to ensure that the coverage of RCVs should be at least 80% or else there would be an age shift in the epidemiology of rubella resulting in an increase in rubella infection among adults and thereby increasing the incidence of CRS. Each country should carefully look into the epidemiology and burden of rubella and CRS, financial resources and surveillance mechanisms before introducing RCVs [11].

Global Measles and Rubella Strategic Plan 2012-2020

The Global Measles and Rubella Strategic Plan is based on the thinking that rubella control efforts must be coupled with that of measles because of the success of the accelerated measles control strategies that were able to reduce measles mortality by 74% of the 2000 estimates in the year 2010.The goal of the Strategic Plan is to achieve measles and rubella elimination in five WHO Regions by the year 2020. The five pronged strategy laid done to achieve this goal included maintaining a high level of population immunity by maintaining high coverage of RCVs, establishing surveillance systems to monitor disease and control measures, efficient outbreak preparedness, engaging the community and research and development for newer vaccines and diagnostic tools [12].

Steps Taken by Ministry of Health and Family Welfare Government of India for Rubella Elimination

India has committed itself to the elimination of Measles and Rubella by the year 2020 in the 66th SEARO regional committee meeting held in New Delhi in 2013. To achieve this, India has included evaluation of rubella antigen and introduction of rubella-containing vaccine as one of the key expected results of the Multi-Year Strategic Plan 2013-17 for Universal Immunisation Programme. The strategies proposed in the plan are to a) establish and expand the surveillance network for Congenital Rubella Syndrome, b) establishment of a Measles- Rubella India Expert Advisory Group (MRIEAG) which would chalk out the plan for introduction of Rubella and monitor progress of control strategies and c) to conduct research on trends of Rubella and CRS [13].

Conclusion

Congenital Rubella Syndrome is an important cause of preventable congenital anomalies among infants. Globally the threat due to CRS is recognised and goals and strategies have been devised to address this problem. India too is committed to resolving this issue. However, we have a long journey ahead with many roadblocks like low coverage rates of routine immunisation, high population density, high levels of migration, misconceptions about vaccinations,etc. that need to be addressed before we achieve the goal of elimination of Rubella and CRS.

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