

Original

Identification of Seronegative Women in Reproductive Age Group Eligible for Immunization against Rubella.

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Abstract: Rubella is a common cause of maculopapular rash with fever in children; however it can be of serious consequence if contracted by a pregnant woman, especially in first trimester, lead as to Congenital Rubella Syndrome (CRS). Aim of this study was to identify the rubella seronegative women in reproductive age group so this group to emphasize the importance of vaccination against rubella in this group. This study was conducted in 670 women of reproductive age group. Screening was done quantitatively using Enzyme Linked Immunoassay-ELISA. Out of the 518 (77.3%) were seropositive, 117 (17.5%) were seronegative; mean age of the study participants was 26.03 ± 4.64 years. Confidence Interval was 13.71-21.29% and p value is < 0.000 . A safe effective rubella vaccine is available, and there are proven vaccination strategies for preventing rubella and eradicating CRS. The introduction of rubella vaccine is cost-effective and cost-beneficial but requires ongoing strengthening of routine immunization services and surveillance systems. We recommend preconceptional rubella screening and implementation of postpartum vaccination.

Key words: Rubella, immunization, vaccination, congenital Rubella syndrome

INTRODUCTION

Rubella is a common cause of maculopapular rash illness with fever in children which can occasionally infect adults. It is a mild self-limiting disease of world wide distribution, however can be of serious consequences if contracted by a pregnant woman, especially in first trimester¹. Material Rubella infection can affect all organs of the developing fetus and causes Congenital Rubella Syndrome (CRS) including miscarriage, stillbirth, abortion, combination of birth defects, asymptomatic infection in the infant. The rate of CRS is 90% and 20% respectively, if women get infected during the first 11 and 20 weeks of pregnancy². Worldwide, it is estimated that there are more than 100, 00 infants born with CRS each year³.

In 1969, to prevent CRS, vaccine developed against live attenuated rubella virus and introduced into immunization programs in many countries⁴. The major reduction in rubella infection since the introduction of measles, mumps, and rubella vaccination is well documented in developed countries. However, approximately 10 to 15% of women reached childbearing age without developing immunity against rubella virus⁵, due to missed opportunities for vaccination, decreased uptake of the vaccine, reinfection of mothers, and immigration from places where rubella is endemic, so these women are at high risk of contracting infection during pregnancy⁶. The major goal of rubella immunization is the prevention of the congenital rubella syndrome. As many as 20 percent of women in the reproductive age group in the United States continue to be susceptible to rubella despite the immunization programs currently in place. Intensified efforts are therefore needed to identify persons with risk for infection and to vaccinate them. Women who develop a rubella like illness during pregnancy should have the diagnosis confirmed serologically because a diagnosis based on clinical criteria alone is unreliable and because of the serious implication of gestational rubella infection.

Inclusion of rubella vaccine in the national immunization program is implemented in less than one-third of the developing countries. There is a need for mechanisms to identify and vaccinate non-immune women. It is essential to evaluate the susceptibility of women

in the reproductive age group to rubella virus in order to set strategies for the prevention of congenital rubella syndrome. Aim of this study is to identify the rubella seronegative women in reproductive age group and to emphasize the importance of vaccination against rubella in women of reproductive age group.

MATERIAL AND METHODS

It was descriptive study of 670 women of reproductive age group, and girls before menarche of women of menopausal age group. Screening was done quantitatively using Enzyme Linked Immunoassay ELISA; IgG antibodies to Rubella in maternal serum is evidence of past infection and it only gives information that the mother has immunity, IgM antibodies to rubella in maternal serum are recent infection. Non pregnant ladies found seronegative were counseled for active immunization. Results were analyzed using SPSS v 10 and chi square test was applied.

RESULTS

670 women of reproductive age were screened; 518 (77.3%) were seropositive, 117 (17.5%) were seronegative and 35 (5.2%) showed the equivocal result (Figure 1).

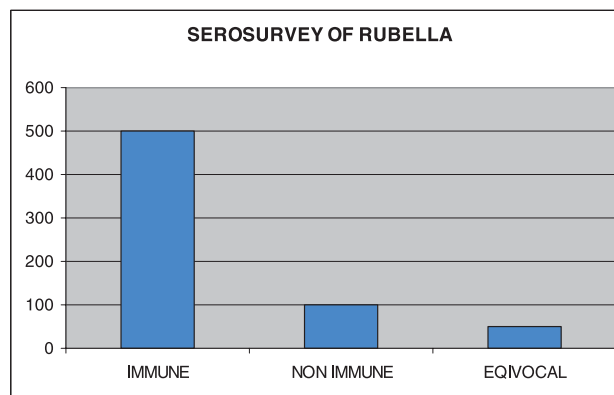


Figure 1: Serosurvey of rubella IgG

Mean age of the study participant was 26.03 ± 4.67 years (table 1). Confidence Interval is 13.71-21.29 and p value is <0.000 .

Table 1: Frequencies of different age group

Age group	Frequency	Percent	Cumulative percent
<20 years	50	7.5	7.7
21-30 years	505	75.4	85.8
31-40 years	83	12.4	98.4
>40 years	9	1.3	100.0
Total	647	96.6	
System	23	100.0	

DISCUSSION

Rubella is a viral infection with minor morbidity and few complications, however its seriousness and health importance stems from the ability of rubella virus to cross the placental barrier and infect fetal tissue resulting in Congenital Rubella Syndrome. There is lack of awareness about existence and impact of Rubella virus infection in Pakistan because of virology service. The strategy for elimination of rubella and CRS depends of immunization of women during fertile period, study of surveillance of rubella and CRS, and control of the disease whenever there is an epidemic. Several studies have been conducted in the past to know the extent of problem as also rubella immunity in child bearing age group. the sample size always remained questionable whether routine rubella immunization in all women whether there is any advantage of introducing antenatal screening.

This study was planned to estimate rubella IgG seronegative women in reproductive age group so as to emphasize the importance of vaccination against rubella in these women. It was observed that only 77.3% of the women were immune to rubella, and 17.5% women were non-immune. In a study from Lahore and Karachi 81.78%, 89% respectively women showed immunity to rubella⁸. Adil MM, et al⁹ observed that 40% women showed were non-immune to rubella; similar were the findings of Tariq WZ, et al¹⁰ in his study at Virology department of Armed forces Institute of Pathology, Rawalpindi. Large scale studies in different setting are however required to describe the CRS burden in Pakistan. Serosurvey of rubella in five blocks of Tamil Nadu India¹¹, showed rubella susceptibility of 48.3%, similar findings were reported from Turkey¹² and Jordan¹³ immunity rate to rubella was 90.9%. In the industrialized countries overall rate of seronegativity for rubella IgG was 2.7% in Manchester¹⁴, in the United Kingdom¹⁵ and 2-3% in Europe¹⁶. Within the Western Cape¹⁷ 95-98% women and in Greece¹⁸ 83.7% women were found immune to rubella. The difference in the of rubella immune status in developed world could be explained by the wider availability, affordability, acceptability and good health care infrastructure. The exact disease load in the community cannot be made out clinically as more than half of the cases are sub clinical and no surveillance program is practiced properly in Pakistan.

In year 2000, Costa Rica¹⁹ set a goal for accelerated rubella control and CRS prevention, that was achieved by measles- rubella (MR) vaccine in a single dose for men and women aged 15-29 years and recommended routine postpartum MR vaccination of all

previously unvaccinated women. Now the European Region of the World Health Organizing (WHO) comprising of 52 members advised to segregate the population into those immune to rubella and those who are susceptible in order to set strategies for the prevention of congenital rubella syndrome (CRS).

This study is also an important step in addressing the issue of prevalence of rubella seronegativity among women of reproductive age group in our community so as to highlight still un-recognized public health problem of congenital rubella syndrome.

CONCLUSION

A safe and effective rubella vaccine is available. The vaccine is cost-effective; strengthening of routine immunization services and surveillance systems is required. We recommend modifying the existing Expanded Program on immunization with inclusion of routine measles, mumps and rubella MMR vaccine at 15-18 month and second dose of rubella vaccine at entering the 10th grade to decrease circulation of the virus among susceptible young females. We also recommend preconceptional rubella screening and implementation of postpartum vaccination

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REFERENCES

1. Gershon A.A. Rubella virus (German measles). In Mandel GL, Bennet JE, Dolin R. Mandell, Douglas and Benner's principles and practice of infection disease Churchill Livingstone Inc: 5th. ed.2000; 1708-1714.
2. Miler E, Cradock Waston JE, Pollock TM. Consequences of confirmed maternal rubella at successive stages of pregnancy. Lancet 1982; 781-94.
3. Robertson SE, Featherstone DA, Gacic-DoboM, Hersh BS. Rubella and congenital rubella syndrome: global update. Rev Panam Salud Publica 2003 Nov;14:306-15.
4. Plotkin SA. The history of rubella and rubella vaccination leading to elimination. 2006Nov 1;3:164-8.
5. Hutchinson MK, Sandall SR. Congenital TORCH infections in infants and young children: neurodevelopmental sequelae and implications for intervention. Top early child Educ 1995;15:65-82
6. Gadhoke I, Aggrwal R, Lal S Khare S. Seroprevalence and incidence of rubella in and around Delhi (1988-2002). Indian J Med Microbiol 2005;23:164-7.
7. Iqbal A, Bokhari SR. Status of Rubella IgG antibody in general population at Lahore. Pak J Path 1997;8:37-41.
8. Kharal SA, Khan MA. Rubella antibodies in Women with Full-Term Normal Delivery and in their Neonates. Pakistan J Obstet Gynaecol 1996;9:29-31
9. Malik Muhammad Adil, Muhammad Zubair, Ali Yawar Alam, Raja K S. Identification of seronegative pregnant women eligible for immunization against Rubella. Rawal Med J 2005;30:22-4
10. Waheed Zaman Tariq, Ziaullah, Karamat Ahmed Karamat. Rubella Virus - cause of preventable congenital anomalies. Pak Armed Forces Med J 2002;52:92-5.
11. Ramamurty N, Murugan S, Raja D, Elango V, Mohana, Dhanagaran D, Serosurvey of Rubella in five blocks of Tamil Nadu. Indian J Med Microbiol 2006; 123:51-4.
12. Sasmaz T, Kurt AO, Ozturk C, Bugdayci R, Oner S. Rubella seroprevalence in women in the reproductive period, Mersin, Turkey. Vaccine 2007 15; 25:912-7.
13. Jarour N, Hayajneh WA, Balbeesi A, Otoom H, Al-Shurman A, Kharabsheh S. Seroprevalence of rubella among Jordanian women of childbearing age. Vaccine 2007 4; 25:3615-8.
14. Miller CL, Miller E, Waight PA. Rubella susceptibility and the continuing risk of infection in pregnancy. BMJ 1987;294:1277-8
15. World Health Organization. Rubella - surveillance to December 1990, United Kingdom. Wkly Epidemiol Rec: 1991;30:217-20.
16. Galazka A. Rubella in Europe. Epidemiol Infect: 1991;107:43-54.
17. Corcoran C, Hardie DR. Seroprevalence of rubella antibodies among antenatal patients in the Western Cape. S Afr Med J 2005 Sep;95:688-90.
18. Gioula G, Fylaktou A, Exindari M, Atmatzidis G, Chatzidimitrou D, Melidou A, Kyriazopoulou-Dalaina V. Rubella immunity and vaccination coverage of the population of northern Greece in 2006. Euro Surveill 2007 Nov1;12F9-10
19. Morice A Carvajal X, Leon M, et al. Accelerated rubella syndrome prevention strengthen measles eradication: The Costa Rican experience. J Infect Dis 2003; 187:158-63.
20. Progress toward elimination of measles and prevention of congenital rubella infection-European region, 1990-2004. MMWR Morb Mortal Wkly Rep 2005;54:175-78.