Rubella IgM antibody positivity among samples of suspected Measles cases tested at a tertiary care centre of Western India

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Abstract*—Measles and Rubella are important vaccine preventable diseases that cause significant morbidity and mortality in developing countries. Objective of present study was to determine Rubella positivity among suspected Measles cases and to describe the epidemiology of Laboratory confirmed Rubella in Rajasthan. A descriptive observational study was conducted at Department of Microbiology, of a tertiary centre of Rajasthan. Samples received from suspected Measles cases from April 2015 to August 2016 were included in the study. The samples were first tested for Measles IgM and those negative for Measles IgM or showed equivocal results were tested for Rubella IgM. Out of total 563 eligible samples from suspected outbreak, 314 (55.8%) samples were found to be positive for Measles IgM. From remaining 249 samples negative for Measles IgM, 104 (18.4% from total suspected measels cases and 41.7% from negative for Measles IgM) were found to be positive for Rubella IgM. Most of these laboratory confirmed Rubella cases were in 5-9 years age group, occurring almost equally among males and females. Most cases were seen in month of March. So it is concluded that laboratory confirmation of every case of suspected Measles for Rubella is necessary for correct diagnosis and to know the true burden of disease. Inclusion of Rubella vaccine in the national immunization schedule is necessary to achieve control of Congenital Rubella Syndrome.*

Keywords: Suspected Measles, Rubella, IgM Antibody Positivity.

I. INTRODUCTION

The leading cause of child mortality in India is vaccine preventable diseases. The vaccine not only protects the children from potentially serious illnesses but also interrupts the diseases transmission in a community. However, in developing countries including India, a large proportion of children are either not immunized at all or partially immunized, resulting in higher infant and child mortality.[1]

Measles is endemic in areas with low vaccination rates, particularly in the developing world. It has been targeted for eradication as the fact that humans are the only reservoir [2]; however, due to social and political factors and high transmissibility, elimination has been achieved in very few regions of the world.[3,4] Rubella is a mild illness that presents with fever and rash. The public health importance of Rubella is because infection in the early months of pregnancy usually affects foetal development. Rubella infection of the foetus can result in miscarriage, foetal death or the birth of an infant with serious congenital birth defects. Congenital Rubella syndrome (CRS) is an important cause of blindness, deafness, congenital heart disease and mental retardation.[5] The Measles & Rubella Initiative was

started to ensure that no child dies from Measles or is born with congenital Rubella syndrome; reducing Measles deaths by 95% by 2015; and achieving Measles and Rubella elimination in at least 5 WHO regions by 2020.[6] India has adopted the goal of elimination of Measles and Rubella & congenital Rubella syndrome control by 2020.[7]

Similar clinical presentation of Measles & Rubella make it difficult to differentiate Rubella form Measles clinically. So it is difficult to identify the true disease burden. Confirmation of outbreak include the positive Measles IgM results of at least two blood samples collected during the outbreak and tested in WHO accredited laboratory. Measles negative samples are further tested for Rubella IgM antibody.[8] Laboratory confirmation of cases of Measles is a vital aspect of surveillance at all stages of control programmes because clinical diagnosis is unreliable.[9]

Present study was conduction with the objective to determine Rubella positivity among samples tested for suspected Measles cases and to describe the epidemiology of Laboratory confirmed Rubella in Rajasthan.

II. METHODOLOGY

A descriptive observational study was conducted at Department of Microbiology, SMS Medical College, Jaipur (Rajasthan) where WHO Sub National Measles and Rubella laboratory had been set up. Samples received from suspected Measles cases from April 2015 to August 2016 were included in the study.

Suspected Measles case was defined as per WHO guidelines. "Any person with high grade fever (38^{o}C or more) with a macula-papular rash and atleast one of the symptoms like conjunctivitis, cough & coryza" was defined as suspected Measles case.[8]

Sample received in poor conditions such as visibly lysed, inadequate collection, and cold chain not maintained during transport or contaminated sample were excluded from study. A total of 563 eligible samples were received at the laboratory during the study period and were included in the study. The samples were first tested for Measles IgM. Samples which were negative for Measles IgM antibodies or showed equivocal results were further tested for Rubella IgM. Ethical clearance was obtained from institutes ethical committee prior to initiation of study.

Data thus collected were compiled and analysed as per objectives of study. Disease burden was describe in proportion and epidemiological factors responsible will be determined with Chi square test. For significance, "p" value <0.05 was accepted as significant.

III. RESULTS

Out of total 563 eligible samples from suspected outbreak, 314 (55.8%) samples were found to be positive for Measles IgM. From remaining 249 samples negative for Measles IgM, 104 (18.4%) were found to be positive for Rubella IgM and 145 samples (25.8%) were negative for both Measles and Rubella IgM (Figure 1).

Figure 1

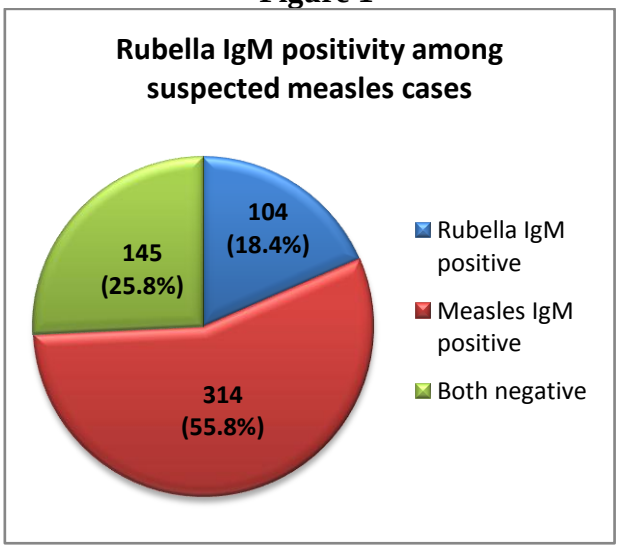
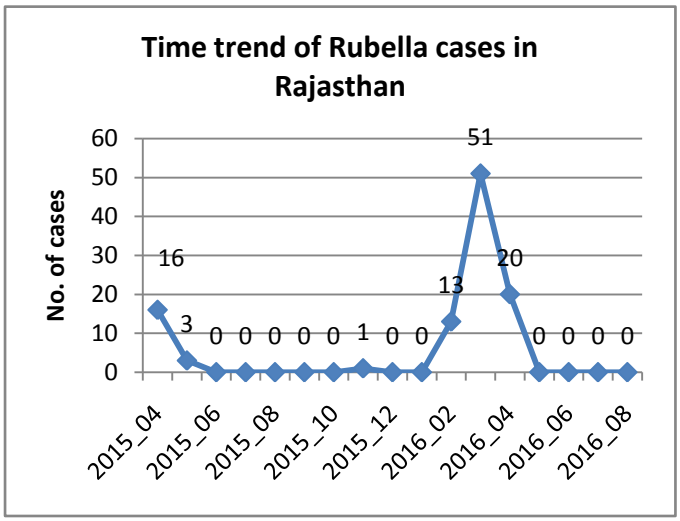


Figure 2



Most of these laboratory confirmed Rubella cases was found in 5-9 years age group. There was no significant difference in age distribution among males and females Rubella cases (Table 1).

Table 1
Age and Sex wise distribution of Rubella Cases

Age group	Male		Female		Total	
	(n=)	%	(n=)	%	(n=)	%
< 1 year	0	0.0	1	2.3	1	1.1
1 - 4 year	8	17.4	10	22.7	18	20.0
5 - 9 years	23	50.0	26	59.1	49	54.4
10 - 14 years	15	32.6	6	13.6	21.	23.3
15 + years	0	0.0	1	2.3	1	1.1
Total	46	100.0	44	100.0	90*	100.0

Chi-square = 6.222 with 4 degrees of freedom; P = 0.183 Level of Significant-Not significant

Rubella cases were seen mainly in months of January to June, with most of the cases seen in month of March (Figure 2).

IV. DISCUSSION

According to NFHS 2015-16 data only 54.8% of children of Rajasthan of ages 12-23 months are fully immunised in which 60.9% are urban and 53.1% are rural. Out of total children population who were vaccinated under national immunisation programme, 78.1% (86.5% urban and 75% rural) children had received Measles vaccine.[10] Misdiagnosis of Measles on clinical grounds has often been reported (EL Mubarak et al).[11] The diagnosis of Measles can be difficult, even for experienced practitioners, especially in individuals with pigmented skin.

In this study 563 samples of clinically suspected Measles outbreaks in Rajasthan were analyzed, out of which 314 (55.8%) were positive for Measles IgM. Out of the 249 samples tested for Rubella IgM, out of which 104(41.7%) were found to be positive for Rubella IgM. Similar results were found in a study by Simbarashe Chimhuya et al[12] where 37.6% were positive for Rubella. In yet another study, V Bansal et al[13] reported 30.7% positivity for Rubella. Sunil R Vaidya et al[14)] reported 27.7% positivity for Rubella.

In present study positivity of Rubella was observed from January to June with peak in March. From June to October, zero positivity for Rubella was observed. Similar seasonal trends were seen in study done by Samoilovich et al[15] in which all Rubella cases were found between January to June. Ian Njeru et al[16] reported Rubella peak in month of March. This can be explained by increased survival of the virus in the dry air and the congregation of children during school terms.

V. CONCLUSION

It can be concluded from this study that the presence of Rubella was found 18.4% of clinically suspected measles cases, which says that it is on a significant scale in Rajasthan. Laboratory confirmation of each and every case of suspected Measles should be done not only for Measles but also for Rubella. In the community, a case based surveillance activity is necessary to know the true burden of disease. Improving immunization coverage and inclusion of Rubella vaccine in the national immunization schedule are necessary steps taken to achieve the national goal of Measles elimination and control of Congenital Rubella Syndrome.

CONFLICT OF INTEREST

None declared till now.

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