

Original Article

# Rubella and CMV Antibodies Screening During Pregnancy - A Retrospective Study in a Tertiary Hospital

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## ABSTRACT

**Background:** In India, RUBELLA & CMV Antibodies screening is routinely carried out, but due to absence of clear intervention, its value is questionable. This retrospective study evaluated the usefulness of rubella & cmv antibody screening during pregnancy. **Methods:** Blood is collected from pregnant women & children, tested for rubella and CMV specific IgM Antibody by capture ELISA. The data were analysed to determine the incidence of rubella & CMV infection during pregnancy & in congenital infections. **Results:** In asymptomatic pregnancy females (n=252) rubella positivity was 1.58% and in woman with BOH (n=110) it was 3.66%, while CMV passivity was 2.9% in both asymptomatic and BOH women. In children (n=100) the overall positivity for rubella and CMV specific IgM antibodies was 7.5% and 12.5% respectively. The incidence of rubella and CMV infections in pregnant women & women with BOH has declined. In children, also the congenital rubella syndrome has declined but for the past 5 years the incidence of CMV infection remained same without any change. **Conclusions:** The incidence of rubella over the past 5 years can be reduced after giving the rubella vaccine to school going girls & women with reproductive age apart from routine vaccine. But CMV infection is a big problem due to unavailability of vaccine & safe treatment against CMV infection, so routine screening for rubella and CMV should be reserved for women with obstetric complications only.

**Key words:** Rubella and CMV Routine screening---pregnant women

## INTRODUCTION


Foetal and neonatal morbidity, early and late childhood morbidity is common in cases where infections are ascended either in utero or during the child birth.<sup>[1]</sup> We know that both CMV and rubella virus are important cause of congenital infections. The endemicity of rubella virus has already been established in India.<sup>[2]</sup> Some countries are routinely added rubella vaccine<sup>[3]</sup> even without a global recommendation for higher coverage (80%), for prevention of congenital infection.

In many part of the world in 1<sup>st</sup> visit routine screening for rubella and CMV antibodies is common, but value of these tests are not reliable<sup>[4-6]</sup> due to overuse and consistent lack of interpretation and reliability.<sup>[7]</sup> In our hospital, we routinely screen the patient to know the maternal antibody status against CMV and Rubella specially IgM antibody.

## METHODS

Study population n=462 cases were screened for Rubella and CMV antibodies from 2010 to 2014 in Dr. V.R.K. Women's Medical College. The samples belong to 3 groups:

1. Children suspected of intrauterine infection(n=100) from paediatrics department of Dr. V.R.K. Women's Medical College.
2. Pregnant women with BOH (n=110) (BOH& consecutive abortion, still births and IUGR h/o congenital malformation) attending the OPD at Dr. V.R.K. Women's Medical College.
3. Asymptomatic pregnant women (n=252) attending the OPD at Dr. V.R.K. Women's Medical College.

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*Antibody detection;*

Blood was taken & serum samples were tested for IgM antibody of Rubella & CMV by M capture ELISA (Adaltis Italy). IgG avidity assay (Euroimmune AG Kit) was used in combination with IgM Elisa for monitoring pregnant women with primary cmv and rubella infection. The tests were performed & interpreted as per the manufacturer's instruction.

Data Analysis For determination of incidence of rubella and cmv in pregnancy & congenital infections data were analysed statistically. Chi square test & student 't' test were used. Stastical significance was assigned to a p value < 0.05, odd ratio and risk ratio were calculated for rubella and CMV infections in asymptomatic women & women with BOH.

**RESULTS**

Out of 462 cases, 252 were asymptomatic, 110 were BOH & 100 were children with suspected intrauterine infection. After analysis, the incidence declined year wise (Table 1, 2) (Fig.1, 2). So, the prevalence of infection was less in subsequent years. So, immunisation in childhood against rubella will prevent repeat abortion, still birth & rubella congenital syndrome. It is important that countries like India which include the rubella vaccine in their national immunization progamme should insure that their strategies should include women in childbearing age also.

In 2010, Rubella infection was 5.4% and CMV infection was 4.8% but in 2014 both were 1.3%. In asymptomatic pregnant women in women with BOH 16.9% and 7.54% respectively in the 2010 to 7.72% and 5.9% in the year 2014. The incidence in children also declined from 25% in 2010 to 11% in 2014 for rubella but CMV infection has remained same in the 5-years period (26% and 30% in 2014) (Fig 2).

Among the symptomatic group, Rubella positivity was 3.16% (8/252) and 5.9% (15/252) positive for CMV infection. In BOH group, IgM antibodies against rubella and CMV infections were 8 (7.7%) and 6 (5.9%) respectively. There was significant difference in prevalence of rubella in asymptomatic group and women with BOH (p value<0.05).

The positivity of Rubella and CMV infection was highest in age group 25-29 years for women with BOH but in asymptomatic group it was high in age group 20-24 years. The prevalence of rubella and CMV infection did not show any significant difference in different age group (Table 1).

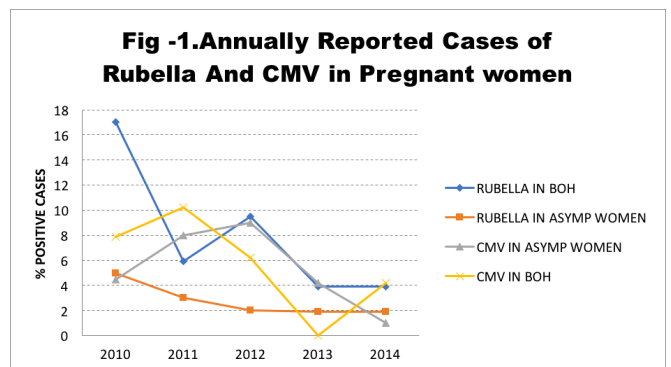
In children, (n=100) suspected intrauterine infections rubella was observed in 15% (15/100) and CMV infection in 25%(25/100). Age wise, both rubella and CMV infection positivity were highest in 1- month- 1- year. The prevalence of rubella and CMV infection did not show any significant difference according to age (p value=>0.05) (Table-1). The children were having cardiac defects, cataract, hepatomegaly with jaundice and microcephaly (Fig 3). Children suspected of CMV infection treated with ganciclovir in Paediatric OPD while rubella positive treated conservatively.

**Table 1. Prevalence of Rubella and CMV according to age**

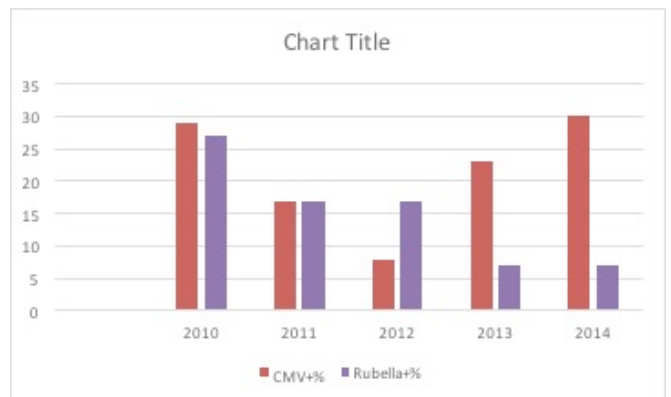
Age	BOH Patient			Asymptomatic patient		
	Rubella +	CMV+	Total	Rubella+	CMV+	Total
<20	0	0	1	0	0	6
21-25	2	2	14	4	10	132
26-30	6	4	83	2	3	81
31-35	1	1	10	1	2	27
>36	0	0	2	0	0	6
			110			252

**Table 2: Age prevalence of Rubella IgM and CMV antibodies in children**

Age	Rubella+	CMV+	Total
<30 days	3	3	17
30 days-1 year	9	21	69
>1 year	3	1	14
Total	15	25	100



**Fig 1: Annually Reported Cases of Rubella And CMV in Pregnant women**



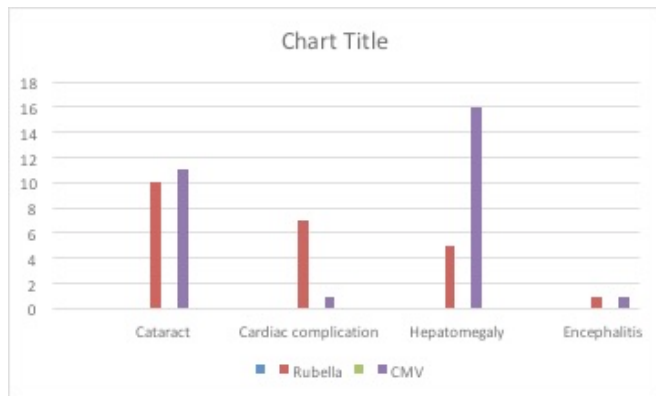
**Fig 2: In children year-wise Rubella and CMV incidence**

**DISCUSSION**

During the study duration of 5 years (2010-2014), we received 462 cases for rubella and CMV infections. 15% children were positive for rubella infection with congenital rubella syndrome, with declining trend 25% in 2010 to 11% in 2014. In the similar study, Singh et al observed 2.8% of children with congenital rubella syndrome.<sup>[2-9]</sup> Rubella positivity in asymptomatic group was 3.16%<sup>[10-12]</sup> similar to other investors (3-9%). Rubella positive in BOH was 7.7% like other observers (10,12%).<sup>[11-14]</sup> This is due to a majority of women in India are immune to Rubella as proven by study conducted by Yadav et al and Gupta et al<sup>[15,16]</sup>. Therefore, screening of Rubella should be reserved

for women with BOH only. The prevalence of rubella infection was lesser in asymptomatic group as compared to women with BOH. It states that low immunity is cause for Rubella infection.

In our study, CMV positivity in both groups asymptomatic & in women with BOH was almost similar (2.9%). The risk was also same in both group. Singh et al<sup>[2]</sup> also had similar observation in both in pregnant women & in BOH group. Other studies also observed 8-27% positivity for CMV.<sup>[14,17]</sup>



**Fig 3: Complications of Rubella and CMV in children**

We have also observed 25% congenital infections with CMV. Broor S et al and Ganghoke et al<sup>[18,19]</sup> also observed 20 and 18.7% positivity for children with CMV. After study the incidence of CMV was almost remained same in past 5 years and was in pregnant women (4.8% in 2010-to 1.3% in 2014). Like Rubella infection, the prevalence of CMV was less in asymptomatic patient as compared to BOH. So, after observation in our study there is no need for routine screening of CMV because of unavailability of safe & efficient treatment. Only women with obstetric complications should undergo testing for CMV infection & recent primary infection. Moreover, those patients were diagnosed with Rubella & CMV infections in 1st trimester were advised to terminate the pregnancy. Those who came in later trimester were counselled for the consequences by the treating obstetrician. In India, no specific standard guideline are available, only counselling & reassuring the patients is done.

## CONCLUSION

To conclude CMV infections is more common than rubella in India, the incidence of rubella has been found to be decreasing in last years & can be prevented by giving vaccine to girls & women in reproductive age. So, routine screening should be reserved for those patients having BOH history. Primary CMV infection can be justified only when reliable tests are used for diagnosis like detection of cmv specific IgM antibody complemented with IgG avidity which will prove or disprove primary infection.

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