Introduction

Rubella is a well-known viral disease which typically manifest as a self-limited disease characterized by erythematous maculopapular rash, low-grade fever, and mild respiratory symptoms.[1] Infection in any pregnant women can cause miscarriage, stillbirth, or multiple congenital rubella syndrome, characterized by cataract, patent ductus arteriosus, septal defects, pulmonary artery stenosis, sensorineural deafness, meningoencephalitis, intrauterine growth retardation (IUGR), and osseous changes. The major concern of this disease is that it can cause a serious, often fatal, congenital rubella syndrome (CRS) in newborns, especially when infection occurs during the first trimester. The percentage of infection in the fetuses of mothers infected by Rubella during first trimester of pregnancy is greater than 80%. Seroprevalence of rubella infection in pregnant women in India varies from 6.5% in asymptomatic to 26.8% in pregnant females with bad obstetric history. Detection of specific IgM by enzyme-linked immunosorbent assay (ELISA) is a useful method for diagnosis of rubella infection and may be helpful in determining the causative role of rubella in abortions and still births.[2]

Materials and Methods

A this study was conducted on 180 blood samples taken from antenatal women who attended Government Maternity Hospital, attached to Sri Venkateswara Medical College, Tirupati. The cases were divided into two groups. Group I (study group) included 150 blood samples from antenatal women in the reproductive age group with history of previous unfavorable fetal outcome in terms of two or more consecutive fetal deaths, intra-uterine growth retardation, still birth, early neonatal death, and/or congenital anomalies. In group II included blood from 30 antenatal women with normal pregnancy outcome in previous pregnancies as the control group. Among the test group, 90 samples were from antenatal women with history of repeated abortions, 55 from cases with history of intrauterine death, 4 from preterm delivery, and 1 from case with history of congenital anomalies during previous pregnancy. All the samples were screened for Rubella-specific IgM antibodies by ELISA using “RUB IgM” kit (Immuno Vision, USA) following the manufacturer’s instructions.

Results

Of the 180 samples tested, 150 were from women with Bad obstetrical history (BOH) and the remaining 30 were from the...
women with previous normal deliveries. Of the test group, 12.67% (n=19) were positive whereas in the control group, 6.67% (n=2) were positive for IgM antibodies to Rubella [Table 1]. In our study within the test group highest percentage (13.33%) of sero-positivity was observed in pregnant women with repeated abortions followed by in intra-uterine death cases (12.73%). Twelve seropositive cases belong to pregnant women with history of abortion (13.33%) and seven seropositive cases belong to pregnant women with history of intrauterine death (12.73%) [Table 2].

**Discussion**

Infection with rubella virus can be disastrous in early gestation. The virus may affect all organs and cause a variety of congenital defects. Infection may lead to intrauterine death, spontaneous abortion, or preterm delivery. Infection with rubella virus is initially unapparent and asymptomatic and it is difficult to diagnose on clinical grounds. Several studies in India and other countries showed the seroprevalence of rubella as 4.66% to 28.6% in women of the reproductive age group. In India, pregnant women belonging to the low socioeconomic group may be exposed to a variety of infections due to poor environment and hygiene. Maternal infections such as rubella can be considered as a significant factor in the causation of poor pregnancy outcome. Ahmed et al.[1] at Karachi, Pakistan, reported that seropositivity for rubella IgM was 18% in women with BOH and 7% in normal pregnant women.[1] In another study, Cao et al.[2] at Hefei, China, reported that 16.29% were positive for rubella IgM antibodies. Yashodhara et al. in Hyderabad reported that 11 (12.5%) cases were positive for rubella IgM antibodies.[2] Mathur et al. reported that 13.8% were positive for rubella IgM antibodies.[3] Ahmed et al. reported that 26.12% were positive for rubella IgM antibodies.[4] Chopra et al. reported that 17.5% women were positive for rubella IgM antibodies.[4] Naveen Thapliyal et al reported that 28.6% cases were positive for rubella IgM antibodies.[5] In the present study, 12.67% women were positive for Rubella IgM antibodies with previous bad obstetric history and the results were similar in the studies conducted in the same state Andhra Pradesh.

Kaur et al. at Maulana Azad Medical College, New Delhi, reported that the seropositivity for rubella IgM antibodies was 8.3% with previous normal delivery.[6] In another study conducted by Zheng et al. it was reported that the seropositivity was 7.4% (109/1471).[7] In the present study, 6.67% were positive for rubella IgM antibodies with previous normal delivery showing the similar findings. This indicates that the normal pregnant women may also have rubella antibodies. It is observed that there is considerable variation in the prevalence of rubella among women of childbearing age in different geographical areas in our country.

**Conclusions**

The present study demonstrated a strong association between rubella infection and BOH in women. It is evident that maternal infection like rubella play a critical role in pregnancy wastage and their occurrence in women with BOH is a significant factor. A previous history of pregnancy wastage and a positive serological reaction during current pregnancy must be considered while managing BOH cases to reduce the adverse fetal outcome. Early detection and timely intervention can prevent morbidity and mortality of infants born to such mothers. All antenatal cases with BOH should be routinely screened for rubella, so that early diagnosis and appropriate intervention of these infections will help in proper management of fetal outcome. In addition to this, there is a need to modify vaccine strategies to immunize all adolescent girls and/or women of child-bearing age before conception to reduce incidence of congenital rubella syndrome and bad obstetric outcome.

**Table 1: Results of IgM antibodies among test and control groups**

| Group                                      | Rubella IgM antibodies | Positive (%) | Negative |
|--------------------------------------------|------------------------|--------------|----------|
| Test group (pregnant women with BOH)       | 19 (12.67)             |              | 131      |
| Control group (pregnant women without any BOH) | 2 (6.67)               |              | 28       |

**Table 2: Test results among various subgroups of pregnant women with bad obstetric history**

| Bad obstetric history | No. of samples tested | No. of positives | Percentage |
|-----------------------|-----------------------|------------------|------------|
| Repeated abortions    | 90                    | 12               | 13.33      |
| Intra uterine death   | 55                    | 7                | 12.73      |
| Preterm delivery      | 4                     | -                | -          |
| Congenital            | 1                     | -                | -          |
| malformations         |                       |                  |            |
| Total                 | 150                   | 19               | 12.67      |

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