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### Original Article

## Relationship of Torch Profile in First Trimester Spontaneous Miscarriage

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### Abstract

#### Background

TORCH is a group of organisms like Toxoplasma, Rubella, Cytomegalo virus and Herpes simplex virus. These groups of organisms causing infections in pregnant lady leads to various degree of adverse pregnancy outcomes in the form of spontaneous abortion, preterm delivery, intrauterine growth restriction, severe congenital defect with syndromic babies. So, to observe the relationship of TORCH infection in first trimester spontaneous miscarriage in our population and to treat them, this study was performed.

#### Materials and Methods

A total of 103 patients with spontaneous abortion meeting inclusion criteria were taken in the study. TORCH profile was sent for those patients and observed the sero-prevalance for IgM and IgG. Thereafter organism was identified and the results were interpreted.

#### Results

Out of total 103 patients enrolled 58.25 % of patients were sero-positive for TORCH complex. IgM or IgG Sero-positive for Toxoplasma, Rubella, Cytomegalo virus and Herpes Simplex virus were 11.65% /17.47% ;7.76% / 43.68%; 19.41% / 41.74% and 31.06% / 54.36% respectively.

#### Conclusion

In the present study on analyzing the association of TORCH antibodies in women with spontaneous abortion, infection with Herpes simplex virus was most commonly associated.

**Key words:** *Infection, spontaneous abortion, TORCH*

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#### Introduction

First trimester of the pregnancy is an important period often associated with complications like bleeding per vagina, pain abdomen leading to severe apprehension to mother. These days' majority of the women conceived around their late thirties as they are carrier oriented. As the age advances, the potential for fertility is decreased and pregnancy losses are also increased. [1, 2] There are various factors causing abortion, like genetic factors, uterine malformations, endocrinological

dysfunction, immunological dysfunctions, infectious agents, environmental pollutants, psychogenetic factors and endometriosis. These are the most important causes of spontaneous abortion. [3, 4] Maternal infections, especially during the early gestation, can result in fetal loss or malformations, as fetal immune system is unable to resist the infectious organism. Many studies have shown that there is significant association between the pregnancy loss and maternal TORCH infections. [5-7]

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TORCH agents are often responsible for abortion and the rate of spontaneous abortion from fetal infection is in range from 10-15%. Primary infection during pregnancy may cause spontaneous abortion or stillbirth. [8]

Toxoplasma gondii is most widely spread parasite that cause toxoplasmosis and it is spread to those patients who deal with cats and its feces, and in those who eats raw meats. It occurs in pregnancy as an acute illness. Rubella virus invades the placenta and the fetus where as cytomegalo virus (CMV) is one of the major causes of congenital infections to newborn. [9]

Herpes Simplex virus (HSV) infection during pregnancy is associated with increased frequency of spontaneous abortion, still birth and congenital malformations. [10] TORCH infection is usually asymptomatic and chronic but many sensitive and specific tests are available to detect its antibody in serum. In this study, we have observed the association of seropositivity of TORCH complex in first trimester, among spontaneous abortion cases.

#### **Materials and Methods**

It is a crosssectional study which was carried out in Department of Obstetrics and Gynecology of Nobel Medical College Teaching Hospital, Biratnagar, Nepal over a period of one year from 1<sup>st</sup> July 2015 to 30<sup>th</sup> June 2016. Ethical clearance from institutional ethical review board (IERB) was obtained before conducting the study. Women with first trimester miscarriage in the form of blighted ovum, missed abortion, incomplete abortion and complete abortion were enrolled. Those patients who were unwilling to participate, women those having bleeding disorder, any chronic medical or surgical illness, uterine malformations, immunological disorder were excluded from the study. Women with molar pregnancy and who had already

taken medical or surgical intervention to terminate the pregnancy were also excluded from the study. All the women who fit inclusion criteria were enrolled either from outpatient department or from the emergency of obstetrics and gynecology department. Five milliliter of blood was drawn from the patient and sent for serological examination of TORCH complex. TORCH IgM & IgG were performed by ELISA kit and the test was done as per instruction. Serological reports were retrieved from the patient's bill number and the report recorded in their files. The interpretation of the results was obtained manually and recorded.

#### **Results**

During the study period a total of 103 patients with first trimester spontaneous abortion, meeting the inclusion criteria were enrolled. Out of 103 patients 58.25% (60) came out to be TORCH positive either in the form of IgG or IgM and 41.74% (43) came out to be TORCH negative.

Among these four organisms most common was herpes simplex virus infections whose seropositivity in the form of IgM were 31.06% (32) and for IgG were 54.36% (56). IgM seropositivity for CMV, Toxoplasma and Rubella were found to be 19.41% (20), 11.6% (12) and 7.76% (8) respectively. IgG seropositivity for CMV, Toxoplasma and Rubella were found to be 41.74% (43), 17.47% (18) and 43.68% (45) respectively.

Both the IgG and IgM negative in Toxoplasma were 32.03% (33) where as both negative in Rubella, CMV, and HSV were 9.70% (10), 9.70% (10), and 1.94% (20) respectively.

Both IgG and IgM were positive in Herpes Simplex virus were 29.12% (30) and for CMV, Rubella and Toxoplasma were 12.62% (13), 2.9% (3) and 2.9% (3) respectively.

The age groups were divided into three sub groups' viz. age less than 20 years, 20-35

years and more than 35 years. The most common age groups with spontaneous abortion were 20-35 years which was 79.6% (82) patients. Beside this, 13% (14) patients were less than 20 years and 6.7% (7) patients were of more than 35 years.

Minimum age of the individual patient was 18 years where as maximum age was 37 years.

Spontaneous miscarriage was mostly seen in primigravida which was 66% (68) of patients than in multigravida with 33.9% (35) patients. The highest gravida was gravida 11 in our study.

Most of the spontaneous miscarriage patients presented with chief complaints of per vaginal bleeding 79.96% (82) in the form of spotting only, or passage of clots or passage of fleshy mass.

Beside these, 20.38% (21) patients had pain abdomen with per vaginal discharge. Most of the patients presented with missed abortion which was around 44.66% (46). Incomplete abortion was seen in 33% (35) patients and complete abortions in 21.35% (22) of patients.

### **Discussion**

In this study done at Nobel Medical College Teaching Hospital with a total 103 enrolled patients, 58.25% were positive for TORCH infection and 41.74% were negative.

In this study the incidence of first trimester spontaneous abortion in teenagers was 13%. This is similar to other study done by Sebastain D et al [5] in kerela, India which also showed that teenager's miscarriage rate was 14.3%. This is higher to 5.5% miscarriage rate among the teenagers in the other studies done in India by Bhalerao et al. [11] The teenage pregnancy rates reported from various parts of the world ranged from 8 - 14%. [5] The patients with 20-35 years of age were highest in number which was 79.6% of total spontaneous abortion patients. In this study minimum age during presentation was 18 years and

maximum age was 37 years. Similar study done by KM Guddy et al [12] in TUTH , Nepal showed that 94.8 % were between 19-35 years of age and only 2% were of age more than 35 years. Another study done in eastern region of Nepal by Pradhan SV [13] also showed that maximum number i.e. 66% of the patient presented with abortion was in between 20-30 years of age and oldest age being 40 years.

In our study, the maximum number of spontaneous miscarriage patients were primigravida which was 66% (68) and 33.9% were multigravida. Maximum gravida was up to 11. Similar study done by KM Guddy [12] also showed the similar results with 68% of spontaneous abortion was in nulliparous patients. Another study done in kerela by Sebastien D et al [5] showed 39.4% were primigravida.

*Toxoplasma gondii* is an obligate intracellular parasite and infection caused by *Toxoplasma gondii* is known as Toxoplasmosis. It is asymptomatic and if acquired during pregnancy, especially as a primary infection may cause damage to the fetus. Apart from being transmitted through infected cat's feces, it can also be transmitted through contaminated vegetables, fruits, and milk.

In this study, IgM seroprevalance for *Toxoplasma* was 11.6% which is also similar to 11.6% in a study done by Kaur R et al [14] whereas another study done by Sebastain D [5] showed 50.7%, which is much higher than our study. Similarly, study done by Tiwari S et al [15] in New Delhi showed IgM for *Toxoplasma* was seen in 9.5% of patients which is also similar to this study.

According to our study, IgG seroprevalance for *Toxoplasma* was 17.47% which indicates that these percentages of patients were already exposed to *Toxoplasma* infection and they are already immune to it. Both IgG and IgM negative for *Toxoplasma* were in 32.03% of

patients thus susceptibility for toxoplasma infection which is also similar to study done by Sebastain D et al [5] who showed 67.7% had immunity against Toxoplasma and 32.2% were susceptible for Toxoplasma infection. But, Ghazi HO et al [16] reported 35.6% patients with immunity against toxoplasma whereas Ustacelebi S et al [17] reported 47.5% of patients.

In this study, IgM seroprevalance for Rubella infection was 7.76% and its susceptibility to infection was 9.70% whereas 41.74 % were already immune to rubella virus. Similar study done by Sebastain D et al [5] reported that IgM Rubella infection rate was 11.3% and susceptible for this infection was in 9.6%. Infection susceptibility for rubella was almost similar to our study. IgM infection with rubella was 14.2% in a study done by Tiwari S et al [15] which is almost double than the findings of our study, whereas IgM for rubella was 4.66% reported by Surpam RB [7] and 4.5 % by Yasodhara P et al [8] which is lesser than our study. Similar study done by Anju et al [19] reported IgM and IgG for rubella was seen in 35.38% and 60% of patients

Cytomegalo Virus (CMV) is a DNA virus which causes a wide variety of clinical manifestation. It is the most common congenital infection with birth prevalence of about 0.5%. IgM infection with cytomegalo virus was 19.41% whereas 41.74% of patients were already immune to this infection and 9.07% were still susceptible for these infections. Similar Study done by Anju A et al [18] reported similar infection rate with cytomegalo virus with IgM in 19.23% of patients, but IgG was in 78.46% of patients which is quiet higher than our study.

In a study conducted by Pradhan SV [13] in Nepal reported majority of the patient i.e. 72.4% had already immune to cytomegalo virurs with recent infection

rate of only 4.5%. In Asia, the reported incidences vary from 0.5% in Japan, and 1.8% in Taiwan, in the presence of a very high rate of preexisting maternal immunity of 90%–100%. [19,20] Another study done by Hani O Ghazi [16] in saudi reported 92.1% pregnant ladies were having IgG positive for cytomegalo virus infection which is very high in comparison to our study.

Though, the HSV IgM and IgG infection is more in our study i.e. 31.06% & 54.36% respectively but only susceptible for this infection was in 1.94% of patients. It showed that most of the patients have already been immunized by HSV infection and they remain with latent state. A Study done by Tiwari S et al [15] reported that 35% of patients had IgM seropositive rate for HSV infection. Similarly, Ghazi HO [16] reported that HSV 1 IgG in 90.9% of patients and for HSV 2 was 27.1% of pregnant Saudi women in 2002. Mohammed J et al [21] reported HSV IgM in 73.9% of patients which is much higher infection rate than our study.

Sebastain D et al [5] reported that IgM infection was 59.2% and IgG was 38.7% for HSV, whereas Ustacelebi S [17] in 1986 reported 87.5% of patient's IgG infection for HSV.

**Conclusion:** As TORCH infection, can cause lot of adverse outcome in pregnancy like spontaneous abortion, preterm delivery, intra uterine growth restriction, congenital anomalies. Herpes virus was detected as one of the most common agent in first trimester spontaneous miscarriage in our eastern part of Nepal. So, TORCH profile can be done in a patients who are planning to conceive. Though TORCH profile is expensive and most of the patients in our set up are poor enough to afford for this infection, still we should send TORCH profile as it is one of the identifiable cause for adverse pregnancy outcome and it can be treated if

detected early in pregnancy. However, a larger study should be carried out to confirm the finding of the present study.

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