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Prevalence of Parvovirus B19 Infection in Successful and Unsuccessful Pregnancy in Zahedan, Southeast of Iran

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To determine the seroprevalence of PVB19 infection in obstetric population, present research was conducted in Zahedan at the southeast of Iran from 2001-2002. In this case-control study, we assayed both virus specific anti-IgG and anti-IgM antibodies among 168 women with term pregnancy (controls) and 156 women with pregnancy loss at first and second trimester (cases) by ELISA method. PVB19Anti-IgG positive rate was 21.8% in pregnancy loss (case) and 20.8% in term pregnancy (control). Parvovirus B19 IgM antibody was detected in 10.3% of case and 6.5% in control. Although specific Parvovirus B19 IgG and IgM antibodies had no statistically significant difference between two groups by the age and parity, but our study showed that the prevalence of parvovirus B19 IgM antibody was higher in women with unsuccessful pregnancy. It is considerable, that high levels of IgM antibody probably support the association between PVB19 infection and unsuccess-pregnancy.

Key words: Parvovirus B19, unsuccess pregnancy, term pregnancy, prevalence

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INTRODUCTION

Parvovirus VB19 is the only pathogenic DNA parvovirus in men that produces a variety of clinical syndromes.

Erythema infectiosum, or fifth disease, is the commonest manifestation of PVB19 infection. It usually presents in preschool and school- aged children as an endemic, benign and self limited mild febrile illness with a maculopapular rash (Slapped check). In adults the rash is less common and infection may involve the joints that usually resolves by 3 weeks but persists in 20% of affected women.

Parvovirus VB19 is transmitted through respiratory secretions or serum via blood transfusions, organ transplantation or transplacentally from mother to fetus.

Twenty five to fifty four percent of adults are immune before pregnancy; the remaining 50% are at risk for infection after exposure.

Thirty to fifty percent of pregnant women were infected after a close exposure. Most affected pregnant women are asymptomatic. According to Yaegashi *et al.* (1999) 1-10% of PVB19 infections during pregnancy are associated with fetal loss especially in the second trimester.

The mechanism by which PVB19 causes hydrops fetalis and stillbirth is unknown. Clinical sign and symptoms and IgG and IgM assay are available to detecting this infection. There isn't any prophylaxis or treatment for infected women but there are three management approaches for fetus including; expectant management-high dose immune globulin and intra uterine transfusion. Several studies have been done in other countries but there was only one study about the prevalence of PVB19 infection in Iran by Modaresi (1999) and there is not any report in Zahedan, a city in Sistan and Baluchestan province in southeast of Iran. Therefore, the aim of the present study was to determine the prevalence of specific PVB19 IgG and IgM antibodies in the term pregnant women and in the women with pregnancy loss.

MATERIALS AND METHODS

To detect the prevalence of PVB19 IgG and IgM antibodies among term pregnant women and women with pregnancy loss at first and second trimester of pregnancy, we conducted an epidemiologic study. In this prospective case control study during a 12 months period (2001-2002) in Zahedan, 324 women were selected randomly, using random number table from pregnant women who admitted at our hospital. One hundred fifty six women had an

unsuccessful pregnancy (case group) and 168 women had successful pregnancy (control group). All subjects were questioned such as age, job, smoking and socioeconomic, familial history for infection, previous blood transfusion and previous pregnancy loss, history of intrauterine fetal death, organ transplantation, hemolytic disorders and immunological disorders. Sera were obtained and evaluated for PVB19 IgG and IgM antibodies by using a commercial enzyme-linked immunosorbent assay (ELISA test, R-biopharm).

RESULTS

In present study mean age of women was 26.8 ± 6.57 years, the average parity was 3.2 ± 1.97 pregnancy. Average abortion was 1.4 ± 1.04 with maximum 8 abortion in one case.

Among 324 pregnant women, 69 women (21.03%) were PVB19 IgG positive and 27 women (8.3%) were PVB19 IgM positive. Although specific PVB19 IgG and IgM antibodies had no statistically significant difference by the age and parity, the prevalence of IgG sero-positive was 21.8% in study group and 20.8 % in control groups. IgM was detected in 10.3% of cases and in 6.5% of control group. ($OR = 1.38, p = 0.23$).

DISCUSSION

The prevalence of PVB19 varies in different parts of the world. This prevalence varies from country to country, from one region to another region and from one group to another group in a country. PVB19 infection during pregnancy increased risk of fetal demise. Present study showed that the prevalence of infection was higher in women with unsuccessful pregnancy and frequency of IgM-positive antibody in successful and unsuccessful pregnancy were 6.5 and 10.3%, respectively. In one study in Norway, seroconversion is similar to that found in other Nordic countries; 36% of pregnant population is seronegative and a third of the pregnant population is susceptible to infection. In Anderson (1998) study 30-60% of adults had antibody against PVB19

In 33% of seropositive pregnant women, vertical transmission occurs. In a virological study by Kinney *et al.* (1998), PVB19 is responsible for 2-3% of first trimester abortions and hydrops fetalis and intra uterine death in second and third trimester of pregnancy.

In our country none of pregnant women with hydrops fetalis and pregnancy loss, was screened in health centers for PVB19. Present study showed that 21% of pregnant women in Zahedan were PVB19 IgG positive (previous contamination) that means low immunity level

to PVB19 In this area. Seronegative women are at risk for PVB19 infection. We did not find a similar study in Iran for comparison. In a seroepidemiological study carried out by Modarresi (1999), in Tehran 91% of general population was found to be IgG positive.

The age of infection varies in different countries. In England, infection with parvovirus B19 is more frequent at age less than 10 years. In Kuwait it's frequent in 10-15 year and in Singapore over 20 year. Although the most infections will be asymptomatic and self-limited, but three groups of people (patients with chronic hemolytic anemia -congenital or acquired immunodeficiency and pregnant women) are at risk for infection and its serious side effects. Most infection occurs in teachers, nurse of library and mothers with school age babies. Thirty to fifty three percent of women with PVB19IgG are not sensitive to this parvovirus. In Maksheed *et al.* (1999) study on 1047 women, 15.4% were IgG positive and 2.2% IgM positive. IgG prevalence in 226 Indian women was 50% by Abraham and Rudraraju (2002). In England PVB19IgG in 20-39 year women was detected in 60% in 2000 by Gilbert (2000). In Alexandrova and Shikova (1999) in Bulgaria IgG prevalence was 50%. In Yaegashi *et al.* (1999) IgG was detected in 46% of women and 9 of 23 women with abortion had IgG. In Matsunaga *et al.* (1995) study in Singapore PVB19IgG was 28% in 25-34 year women. According to this study PVB19IgG prevalence in Zahedan is similar to Singapore and IgM prevalence is similar to another part of the world, 10.3% in unsuccessful pregnancy and 6.5% in success pregnancy. In Yaegashi *et al.* (1994) PVB IgM was 7.1% in 43 women with hydrops fetalis. 2.5% of 226 women in 1997 at Hong Kong were IgM positive by Lim *et al.* (1996) 5.02% of 2279 women was PVB19IgM positive and in 8.7% of whom hydrops fetalis occurred. In 0.43% of women hydrops fetalis occurred due to PVB19. In Skjoldebrand-Sparre and Fridell (1996) 7.6% of 457 women was IgM positive.

CONCLUSIONS

Although, CDC dose not recommended that pregnant women should routinely be examined for infection, since in our study, 10.3% of the women with pregnancy loss had a positive test for Parvovirus B19 IgM antibody, we

advise frequent measurement of IgM during first, second and third trimester of pregnancy,

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