

Parvovirus Infection and Seropositivity in a Group of Pregnant Women

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OBJECTIVE: Detection of parvovirus B19 seropositivity in a group of pregnant women.

STUDY DESIGN: Parvovirus B19 IgM and IgG seropositivity was investigated in 58 pregnant women.

RESULTS: None of the 58 pregnant women had parvovirus B19 IgM seropositivity and 27% (n: 16) of the patients had IgG seropositivity.

CONCLUSIONS: Parvovirus B19 IgG seropositivity increases in pregnant women by aging and it is reported as 60- 70 %. In our study the seropositivity was lower than the rates reported in the literature. Parvovirus B 19 infection is rare during pregnancy. Maternal- to- foetal transmission during acute maternal infection is about 33 %. Most of the foetal infections are asymptomatic. Common clinic presentations are miscarriage or foetal non-immun hydrops. In our opinion, routine screening of parvovirus B 19 infection should not be recommended during pregnancy and screening should be limited with the hydropic fetuses because of some reasons including rarity of acute maternal infection during pregnancy, difficulty in predicting of foetal transmission, and irrelevance with fetal anomalies, rarity of miscarriage and hydrops foetalis even if fetal infection is considered.

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Key Words: Parvovirus B 19 infection, Pregnancy, Seropositivity, Non- immun hydrops foetalis

Introduction

Pregnancy induces a transient immunosuppression, which is thought to cause an increase in susceptibility to viral infections during pregnancy.¹

Parvovirus B19 is a non- envelope DNA virus in parvoviridae family. Clinic infection manifests as skin eruptions in childhood (fifth disease, erythema infectiosum). In healthy individuals, asymptomatic infection is the most common clinic presentation. However it may cause severe complications in cases with hemolytic anemia (aplastic crisis), HIV infected persons and pregnant women. Parvovirus B 19 primarily invades erythrocyte precursors and megacaryocytes and causes apoptosis in these cells.²

The human parvovirus B19 was discovered in 1975 by Cossart but its etiological association with erythema infectio-

sum and foetal hydrops was proved only in 1984-1985.³

Parvovirus B 19 is associated with foetal demise, anemia, thrombocytopenia, myocarditis and non-immun hydrops. 1/3000-4000 of hydrops foetalis cases is related with Parvovirus B19 infection.⁴

To the best of our knowledge there is no data about Parvovirus B 19 prevalence in Turkish pregnant population. So we investigated Parvovirus seropositivity in a group of pregnant Turkish women admitted to our outpatient clinic.

Material and Methods

Fifty- eight asymptomatic pregnant women who applied to our outpatient clinic between October 2006 - October 2007 were included to the study. Parvovirus B19 Ig M ve Ig G antibodies were measured with Micro- ELISA (RIDA- Screen) method.

Results

Mean age of the cases was 24.8 and mean gestational age at enrollment was 16 week+ 1 day. Mean gravidity and parity were 2.9 and 1.8, respectively.

None of the 58 patients had parvovirus B19 Ig M seropositivity and 27 % (n: 16) of them had Ig G seropositivity.

Discussion

Parvovirus B19 infection usually spread out by droplets. But it can also spread out by contaminated blood, blood products and vertically from the mother.⁵ It usually causes epidemy

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and contaminations are seen during these periods. The risk of infection among susceptible adults following household exposure to a B19 infected person is approximately 50 % and following school exposures during outbreaks 20 % to 30 % .⁶

Virus makes viremia after 7 days from the entrance to the body. Incubation period is usually 4-14 days, and sometimes it takes 20 days. After the clinical signs appear, the infection is no more contagious.

Ig M level elevates about 10 days after the transmission when the first skin rash is seen. Ig M declines after 2 months, but sometimes it takes 6 months. Ig G begins to increase after a few days later the Ig M elevation. Both Ig M and Ig G positivity show the infection between 7-120 days. So Ig M positivity support the acute infection but it can not always prove the diagnosis of an acute infection.²

If Ig M is seropositive in a pregnant women, serial ultrasonographic examinations must be⁷ made to detect possible hydrops foetalis. Diagnostic criteria according to the serologic data are showed in table 1

Table 1: Interpreting Results of Parvovirus B19 Antibody Testing

Antibody Results	Status	Follow- Up
Ig G (-) Ig M (-)	Susceptible to disease	Repeat testing (preferably with paired blood) in 2 weeks
Ig G (+) Ig M (-)	Immune: past infection at least 4 months prior to blood draw	Reassurance
Ig G (-) Ig M (+)	Infection within last 7 days	Suggests recent infection. Refer for consultation and serial ultrasounds
Ig G (+) Ig M (+)	Infection within past 7 to 120 days	Suggests recent infection. Refer for consultation and serial ultrasounds

Adapted from Devine.⁶

Usually disease spreads out by children. So, teachers and other workers in nursery schools and babysitters are the populations under risk. Nursery school teachers have the highest occupational risk, but most infections seem to be the result of exposure to the woman's own children.⁸ In a study three factors showed statistical significant associations with an increased risk of achieving an acute B19 infection among susceptible pregnant women: having children at home, suffering from serious medical disease and a stressful job situation.⁹

Pregnant women who are under risk are recommended to make serologic investigation. If Ig G is positive there is no risk for infection. If the patient is seronegative she must be informed about the transmission ways of the infection and protection from it.¹⁰ Practically this is not possible. Because the infection is contagious before the clinical signs appear. Then, the infection is no more contagious. In a study, a decrease in the infection rate in pregnant women was not detected although they were removed from the contagious area.⁴

Serologic tests must be performed in a pregnant woman who has a contact with an infected person If she is seronegative, tests must be repeated after 2-4 weeks.

In a study from Finland, among some infections caused by varicella zoster virus, cytomegalovirus, herpes simplex virus and parvovirus B19, the most frequent infection was parvovirus B19 during pregnancy¹

Parvovirus B19 prevalence was found in Spanish, Japan, Kuwait, German, Swedish studies as 35%, 40%, 53.3%, 54%, 81% respectively.¹¹⁻¹⁵ In our study Ig G seropositivity was lower than the rates found in these studies.

If a pregnant woman has an acute infection, foetal transmission rate is 33 % .¹⁶ Foetal infection is usually asymptomatic. Foetal anomalies caused by the infection were reported in some case reports. But there isn't any important teratogenic effect.¹⁷ In foetal infection, miscarriage or foetal non-immun hydrops are common clinic presentations. In a Russian study compared parvovirus seropositivity between the groups include normally pregnant and recurrent aborters, little difference was found in total Ig G antibodies between the groups (75.3 % and 66.9 %, respectively).¹⁸

Non-immun hydrops is associated with anemia and heart failure. If Ig M is positive, hydrops can be seen after 2-4 weeks. For that reason, patients must be followed up by weekly US scanning for a duration of 6- 10 weeks.¹⁹ Non-immun hydrops is seen approximately in 1 % of the acute maternal infections.⁵ Miscarriage rates are 10 % in first trimester, and about 1 % after 20th week of gestation.²⁰

It's important that spontaneous remission can be seen in hydrops cases. If spontaneous remission doesn't occur, intrauterine blood transfusion increases foetal survival significantly. In a study, spontaneous remission has been reported in 54 % of 269 parvovirus B19 associated hydrops cases. In the rest of the cases, 84 % of them survived after intrauterine blood transfusion.¹⁹ Although foetal survival is low in non-immun hydrops related with other causes, in parvovirus B19 associated hydrops prognosis is better and survival rate is as high as immune hydrops.

In our study, none of the cases has parvovirus B19 Ig M seropositivity. In the literature Ig M seropositivity is 1.3 and

2.2 % .^{1,13} Although the rate of Ig G seropositivity reported in the literature is between 35-81 % ,¹¹⁻¹⁵ we found out a rate of 27 % in our study population. This rate is quite lower than the literature. Parvovirus B19 seropositivity increases by aging. In geriatric populations it is around 85 % .²¹ Mean age was 24.8 in our study. In our country marriage age is lower than in western countries. This reason may explain the lower rates. To the best of our knowledge there is no data about Parvovirus B19 prevalence in pregnant women in Turkey. So we don't know if this data represents the whole Turkey or it is only limited to our region.

According to the data both in our study and in the literature, the seropositivity of Ig M is very low (zero in our study), and seropositivity of Ig G is high. It means that parvovirus B19 acute infection is rare during pregnancy. On the other hand, prediction of transmission is impossible, transmission of acute infection from mother to the foetus is around 33 % and foetal infection is usually asymptomatic. Parvovirus B19 infection does not cause foetal anomaly, but it is associated with miscarriage (1-10 %) and hydrops foetalis (1 %). Spontaneous remission has been reported in 54 % of parvovirus B19 infection associated hydrops cases. And the rest of the cases, 84 % of them survived via intrauterine blood transfusion. Depending upon the informations above routine screening of parvovirus B19 infection during pregnancy is unnecessary and it is not cost effective. So screening must be limited with the hydropic foetuses.

Bir Grup Gebede Parvovirüs Enfeksiyonu ve Seropozitivitesi

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Bir grup gebede parvovirus B 19 seropozitivitesinin saptanması.

Elli sekiz gebede parvovirus B 19 IgM ve IgG seropozitivitesi araştırıldı.

Elli sekiz gebenin hiçbirinde IgM seropozitivitesi saptanmadı ve % 27'sinde (n= 16) IgG seropozitivitesi saptandı.

Parvovirus B 19 IgG seropozitivitesi gebelerde yaşla birlikte artar ve yaklaşık % 60- 70 oranında bildirilmektedir. Bizim çalışmamızda seropozitivite oranı literatürde bildirilenden daha düşüktür. Gebelik esnasında parvovirus B19 enfeksiyonu nadirdir. Akut maternal enfeksiyon esnasında anneden fetusa geçiş % 33' tür. Fetal enfeksiyonların çoğu asemptomatiktir. En sık karşılaşılan klinik durumlar düşük ve fetal non-hidrops fetustür. Gebelik esnasında parvovirus B19 enfeksiyonunun rutin taramasını önermemekteyiz ve akut maternal enfeksiyonun seyrek görülmesi, fetal geçişin önceden gösterilememesi ve fetal enfeksiyon oluşsa bile fetal anomali yapmaması, düşük ve hidropsun ender görülmesi nedeniyle tarama sadece hidropik fe-

tuslarla sınırlandırılmalıdır.

Anahtar Kelimeler: Parvovirus B19 enfeksiyonu, Gebelik, Seropozitivite, Non- immun hidrops fetalis

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