Prevalence of Viral Infections in High Risk Pregnancies

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ABSTRACT

Introduction: Prevalence of viral infections in high risk pregnancies has not been studied so far in our population. Current research aimed to study the prevalence of viral infections in high risk pregnancies.

Material and methods: The Study was prospective for a period of one and a half year. Hundred high risk patients with hundred controls were studied. The viral infections studied included Rubella, Herpes Simplex Type 1 and Type 2, Cytomegalovirus (CMV), HBsAg, HCV, HIV-1 and 2

Results: The mean age of the women in the study group was 25.2±4 years and in the controls was 25.2±4 years Out of 100 cases studied 29% were positive for CMV, vs 6% control group ($p < 0.05$), 19% were positive for Rubella IgM, vs 1% in controls. 21% cases were positive for HSV-1/ HSV-2 IgM, vs 7% in controls, 5% were positive for HbsAg, vs nil in controls. 7% were positive for HEV IgM, vs nil in controls. No case of HCV IgM was found in study or control group. One case of HIV IgM was found in study group and none in control group.

Conclusion: The seroprevalence of viral infections is significantly higher in high risk pregnancies as compared to controls. CMV infection was the most prevalent viral infection in our studied population.

Keywords: High Risk Pregnancies, Viral Infection

INTRODUCTION

With the increasing advances in modern obstetrics decreasing maternal and fetal morbidity and mortality is of prime focus. A broad spectrum of micro-organisms are capable of causing fetal infection. Viral infections are a major cause of morbidity and mortality for both the mother and fetus. Infections can occur in the neonate transplacentally, perinatally or postnatally from breast milk or other sources. Traditionally the only viral infections of concern were those caused by Rubella virus, Cytomeglovirus and Herpes Simplex virus. In recent years HIV, Hepatitis-B virus and Hepatitis-C virus and Hepatitis E virus are emerging as cause of maternal and fetal morbidity. HEV is especially associated with high maternal mortality. Worldwide congenital HIV infection is major cause of infant and childhood morbidity and mortality with estimated 4 million deaths since start of epidemic. With recent advances in microbiology and improvement in diagnostic facilities, viral diseases and their management are sought to improve antenatal workup of mothers to minimize infection in both mother and conceptus. Most common virus causing fetal malformations is Rubella. Risk of congenital infection is highest in first trimester with 90-100% birth defects.

Most common cause of congenital neonatal infection is cytomegalovirus with incidence of 0.5 to 2.2%. As 50-90% of women of child bearing age have antibodies to CMV but only rarely does CMV reactivation result in neonatal infection. Most common cause of ulcerative STD is Herpes. Recent study has shown upto 20% of women acquire new herpes infection during pregnancy. Approximately 60% of newly infected women are asymptomatic and only 34% develop genital infections by HSV(2)-75% and HSV(1)-25%.If herpes seroconversion occurs early in pregnancy the risk of transmission to newborn is very low 4%.Women who acquire genital herpes shortly before delivery, risk of transmission is high 86% with increased incidence of preterm labour. Infection in newborn may be asymptomatic or localized in CNS, eyes, skin and mucosa or it may disseminate to involve major viscera with mortality of 60%. Acute viral hepatitis is most common cause of jaundice in pregnancy. Acute viral hepatitis is a systemic infection predominantly affecting liver. It is caused by six distinct viruses namely hepatitis A, B, C, D, E, G. The risk of HBV transmission is 10% in first trimester and as high as 90% in third trimester. Most vertical infection occurs perinatally. Post exposure prophylaxis is possible with hepatitis B vaccine and immunoglobulin. HIV is rapidly spreading with an estimated half million HIV positive women becoming pregnant each year. Women with HIV are young and 80% are between 18-44 years of age. According to sentinel surveillance data, HIV infection during pregnancy has crossed 2% in Mumbai and is less than 1% in Delhi and Uttar Pradesh. Identification of HIV infection during pregnancy helps in decision making regarding termination or continuation of pregnancy with subsequent intervention to decrease perinatal transmission and further management. With all this back ground we undertake this study to determine the sero prevalence of common viral infections in high risk pregnancies. Current research aimed to study the prevalence of viral infections in high risk pregnancies

MATERIAL AND METHODS

The study "Viral serology in high risk pregnancy" was conducted in Department of Obstetrics and Gynecology L.D Hospital, G.M.C Srinagar. The Study was prospective for a

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period of one and a half year. Hundred high risk patients with hundred controls were studied.

The high risk patients were included in the study group if they fulfilled one or more of the following criteria.

Inclusion criteria

Pregnant woman having any of the following were taken:

1. History of fever with rash in past or present pregnancy.
2. History of jaundice in past or present pregnancy.
3. History past or present preterm delivery.
4. Congenital malformation in past or present pregnancy.
5. History of spontaneous abortion, still birth, intrauterine death or early neonatal death.
6. Pregnancy with history of high risk behavior.

Exclusion criteria

Woman with pregnancy of medical disorders like heart disease, liver disease, renal disease, CNS disease, Blood dyscrasia etc were excluded.

Control group

Pregnant women without any of the above mentioned criteria were included in the control group.

Methods

- A detailed and comprehensive history was taken from each patient according to proforma which includes history, physical examination (General, Local and systemic).
- Informed consent was taken prior to sampling an examination.
- Pretest and post test counseling for HIV.

Following laboratory tests were performed

1. Routine Blood group, Complete blood count, Bleeding time, Clotting time, KFT, LFT, Blood sugar, Urine examination, VDRL, Ultrasonography (USG)
2. Following special investigations were performed

   Rubella IgM ELISA Test, Herpes Simplex Type 1 IgM Enzyme Immunoassay, Herpes Simplex Type 2 IgM ELISA, Cytomegalovirus (CMV) IgM antibody EIA Test, Detection of HBsAg by ELISA (Qualisa Kit), Detection of IgM anti-HCV antibody by ELISA (ElAgen HCV Ab Kit), Detection of HEV antibody by ELISA, Microwell ELISA for detection of antibodies to HIV-1 and 2

The results thus obtained were used to calculate the prevalence of infections in cases and controls.

RESULTS

The mean age of the women in the study group was 25.2±4 {range19-35years} and in the controls was 25.2±4 {range19-35years}. The difference was not statistically significant between the two groups. ($p>0.05$). The age distribution of subjects is shown in Table 1. Out of 100 cases taken, 33(33%) were having history of abortions, while 16(16%) had history of pre term labour, 17 (17%)had history of IUD, 4(4%) had history of still birth and 6(6%) had history of congenital malformations. Maximum cases had history of abortions. The controls were of low risk group and had no such history. The difference was statistically significant between the two groups ($p<0.05$)as shown in Table 2. Out of 100 cases in study group 27(27%) were positive for CMV IgM while in control group 6(6%) were positive. The difference between the two groups was statistically significant ($p<0.05$).In study group 19(19%) were positive for Rubella IgM while in control group 1(1%) were positive. The difference between the two groups was statistically significant ($p<0.05$). Out of 100 cases in study group 21(21%) were positive for HSV 1 / HSV 2 IgM while in control group 7(7%) were positive. The difference between the two groups was statistically significant ($p<0.05$). Out of 100 cases in study group, 5(5%)

Age in years	Study		Control		p value
	n	%	n	%	
≤ 20	12	12.0	10	10.0	0.302
21 to 25	51	51.0	46	46.0	
26 to 30	27	27.0	31	31.0	
31 to 35	10	10.0	13	13.0	
mean ± SD	25.2 ± 4.0 (19, 35)		25.2 ± 4.0 (19, 35)		

Table-1: Age distribution of the studied subjects (in years).

		Study		Control		p value
		n	%	n	%	
Abortion	No	67	67.0	100	100.0	0.000
	Yes	33	33.0	0	0.0	
Preterm Labor	No	84	84.0	100	100.0	0.000
	Yes	16	16.0	0	0.0	
IUD	No	83	83.0	100	100.0	0.000
	Yes	17	17.0	0	0.0	
Still Birth	No	95	96.0	100	100.0	0.043
	Yes	4	4.0	0	0.0	
Congenital Malformation	No	94	94.0	100	100.0	0.013
	Yes	6	6.0	0	0.0	

Table-2: Distribution of studied subjects in relation to past clinical history

		Study		Control		p value
		n	%	n	%	
Rubella IgM	No	81	81.0	99	99.0	0.000
	Yes	19	19.0	1	1.0	
CMV IgM	No	73	73.0	94	94.0	0.000
	Yes	27	27.0	6	6.0	
HSV 1 / HSV 2 IgM	No	79	79.0	93	93.0	0.004
	Yes	21	21.0	7	7.0	
HBsAg	No	95	95.0	100	100.0	0.024
	Yes	5	5.0	0	0.0	
HEV IgM	No	91	91.0	100	100.0	0.002
	Yes	9	9.0	0	0.0	
Anti HCV	No	100	100.0	100	100.0	1.000
HIV	No	100	100.0	100.0	100.0	1.000
	Yes	0	0	0	0.0	

Table-3: Serology in the Studied Subjects

were positive for HBsAg while in control group no case was found. The difference between the two groups was statistically significant ($p<0.05$). Out of 100 cases in study group 9(9%) were positive for HEV IgM while in control group no case was found. The difference between the two groups was statistically significant ($p<0.05$). No case of HIV or HCV was found in either group, the difference in the groups were statistically insignificant ($p>0.05$). The above data showed that maximum number of cases were infected with CMV. Among the hepatitis virus the most number of cases were infected with HEV. The details are shown in Table 3.

DISCUSSION

We studied the prevalence of viral infections in high risk pregnancies and compared with low risk pregnancies. We noted that in study group 19(19%) were positive for Rubella IgM while in control group 1(1%) were positive. Deeka Depta et al[1] 2006, showed that acute Rubella was present in 1% of women in early pregnancy. The study was done in low risk population and is consistent with the results obtained in the control group in this study. Rajendra et al[2] 2006, in their study (Serological study for TORCH in women with bad obstetric history) showed seropositivity for Rubella IgM to be 4.66% which is less than our study. The seropositivity for Rubella IgM in control group was 1.31% which is consistent with our control group. Denoj Sebastain 2008[3], in his study of TORCH serology for IgM specific antibodies in women with previous poor outcome revealed Rubella positivity to be 11.3% which is less than our study group. Koltsova 1999[4], in his study of serology in women with pathological course in pregnancy concluded Rubella IgM positivity to be 14.5% which is consistent with our study. Dai B et al 1992[5], reviewed 350 women from Cohort of high risk pregnancy and found that 15% were susceptible for Rubella, which is consistent with our study. Mini P Singh et al 2009[6], found in their study that in asymptomatic women Rubella IgM positivity was 0.7% which is consistent with our control group while in women with obstetrical complications it was 3.4% which is less than our study group.

CMV

Out of 100 cases, we noted that in study group 27(27%) were positive for CMV IgM while in control group 6(6%) were positive. The difference between the two groups was statistically significant ($p<0.05$) Munro et al[7] 2005, screened 600 pregnant and found 5.5% were CMV IgM positive which is consistent with our control group. Micheal and Catherine[8] 2005, found that primary CMV occurred in 4% of pregnant women which is consistent with our control group. Rajendra et al 2006, in their study serological study for TORCH in women with bad obstetric history showed seropositivity for CMV to be 5.33% which is less than our study group, while for control group seropositivtiy for CMV IgM was 1.33% which is less than our control group.

Turbarkar et al[9] 2003, reported incidence of CMV IgM in pregnant women with bad obstetric history to be 8.4% which is less than our study group. Denoj Sebastain in his study for IgM positivity in women with previous unfavourable outcome revealed CMV positivity to be 28.3% which is consistent with our study. Mini P Singh et al 2009, reported in their study in women with obstetrical complication CMV positivity in both cases and controls to be 7.8% which is consistent with our control group.

HSV1/HSV2

Out of 100 cases in study group 21(21%) were positive for HSV 1/ HSV 2 IgM while in control group 7(7%) were positive. The difference between the two groups was statistically significant ($p<0.05$). Turbarkar et al 2003, reported incidence of HSV-1/HSV-2 IgM in pregnant women with bad obstetric history to be 3.6% which is less than our study group. Rajendra et al 2006, in their study serological study for TORCH in women with bad obstetric history showed seropositivity for HSV-1/HSV-2 IgM to be 8.66% which is less than our study group, while for control group seropositivtiy for HSV-1/HSV-2 IgM was 4.1% which is less than our control group. Denoj Sebastain in his study for IgM positivity in women with previous unfavourable outcome revealed HSV-1/HSV-2 IgM positivity to be 59.2% which is higher than our study.

Jaundice

Pregnant women with jaundice were 20 in high risk group, out of these 5 i, e 25% were positive for HbsAg, while 7 i, e 35% were positive for HEV IgM, while only 1 i, e only 2% were positive for HCV IgM. In total 65% of cases of jaundice were due to infective causes. Christine et al[10] 1999, stated that acute viral hepatitis to be most common cause of jaundice in pregnancy, which is consistent with our study. Silvia Sookain et al[11] 2006, stated that acute viral hepatitis is most common cause of jaundice in pregnancy, which is consistent with our study. Yuel Veronica et al[12] 2006, in their study concluded that 61.54% patients admitted with jaundice had viral hepatitis, which is consistent with our study. Sharda Patra[13] 2007, stated that acute viral hepatitis was most common cause of jaundice in pregnancy. Out of 316 patients with jaundice 224 i, e 69% had viral hepatitis, which is consistent with our study.

HBV

In our study 20 women presented with jaundice in high risk group, out of these 5 were HbsAg positive. HBV constituted 25% cases of jaundice. Tsegae et al[14] 1992, in their study of 110 cases of acute sporadic hepatitis among Ethiopian women found HbsAg in 22%, which is consistent with our study. S.P Jaiswal et al[15] 2001, in their study from north India observed HbsAg in 19% of hepatitis patients, which is consistent with our study. Archana[16] 2004, observed that incidence of HBV in pregnant women with viral hepatitis to be 25.4%, which is consistent with our study.

HEV

In our study 20 women presented with jaundice in high risk group, out of these 7 were HEV IgM positive. HEV constituted 35% cases of jaundice. Tsega et al 1992,[14] in their study of acute sporadic hepatitis in 32 pregnant women determined 19 (59%) has HEV infection, which is more than our study. S.P Jaiswal et al 2001,[15] in their study from north India observed HEV IgM in 58% of hepatitis patients, which is more than our study.

Yuel Veronica et al 2006,[16] in their study of 40 women with viral hepatitis during pregnancy found that HEV accounted for 62.5% of cases, which more than our study. M.S Khuroo[17] et al, in their study of etiology clinical course and outcome of acute viral hepatitis in pregnancy concluded that 85.5% of pregnant women had HEV, which is more than our study.

Past history in studied subjects

In our study 33% cases had history of abortion, 16% had history of pre-term labour, 17% had history of Intrauterine death, 4% had history of still birth, while 6% had history of congenital malformation. Rajendra et al 2006, in their study of women with BOH 27.27% had history of abortion, 18.18% had pre-term labour, while 17.64% had history of intrauterine death.

CONCLUSION

The seroprevalence of viral infections is significantly higher in high risk pregnancies as compared to controls. CMV infection was the most prevalent viral infection in our studied population

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