

Varicella Infection During Pregnancy- Maternal and Fetal Outcome; Case Series and Analysis in a Tertiary Centre in South India!

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Abstract

Background: This is a retrospective study undertaken to analyse the maternal and fetal outcome of varicella infection during pregnancy.

Methods: This is a retrospective observational study done in Kerala Institute of Medical Sciences, Trivandrum, a tertiary care hospital in South India. Sixty nine women infected with chickenpox during pregnancy from January 2009 to February 2018 (9 years) were taken for the study.

Results: The incidence of chickenpox during pregnancy in our study was 33.7 in 10000 pregnancies. There were no spontaneous miscarriages. The incidence of congenital anomalies was 7.2% and when compared to the overall obstetric population of the nine year study period in which the incidence was 6.5 %, there was no statistical significance (p- 0.99). The incidence of preterm labour was 4.7% and when compared to the overall obstetric population in which the incidence was 15 %, there was a statistically significant less incidence (p- 0.035). The incidence of polyhydramnios was 4.7% and when compared to the overall obstetric population in which the incidence was 1%, there was a statistically significant increased incidence (p - 0.018). The incidence of fetal growth restriction was 13% and when compared to the overall obstetric population in which the incidence was 12.4%, there was no statistically significant difference (p- 0.963)

Conclusions: The maternal and fetal complications with chickenpox infection during pregnancy were more when infected in the first trimester. Early treatment, screening and followup will reduce the maternal and fetal morbidity

Keywords: varicella infection, pregnancy, maternal, fetal, outcome

Introduction

Chickenpox is a highly contagious disease caused by varicella zoster virus of the herpes family. It is transmitted primarily from person to person by airborne respiratory droplets and by direct inoculation into the mucous membranes or the conjunctiva. While generally mild and of short duration in healthy children, varicella can be associated with significant morbidity and mortality in pregnant women and neonates.¹ Incidence of chickenpox in pregnancy is about 1-5 per 1000 pregnancies.² Infection early in gestation can cause more severe damage or still birth.¹ Spontaneous miscarriage doesn't appear to be increased if chickenpox occurs in first trimester. Fetal effects of varicella can manifest as either congenital varicella syndrome or neonatal varicella. Peripartum exposure of baby to the virus may lead to neonatal varicella.³ IUGR and low birth weight are found in some cases.⁴ This study is taken to know the maternal and fetal outcome of varicella infection in pregnancy.

Methods

This is a retrospective study done in Kerala Institute of Medical Sciences, Trivandrum, a tertiary care hospital in south india. The study has been approved by the institutional ethical committee. Data over a period of

nine years i.e from January 2009 to February 2018 was taken from the Department of High risk obstetrics. Pregnant women infected with chickenpox, both booked and referred cases were taken into the study. There were 69 cases of varicella infection in pregnancy during this nine year period. The diagnosis of infection was done clinically. Out of these 69 women, 15 were lost for follow up at different periods of gestation. These 15 women were contacted by phone and the date needed was collected.

Results

From January 2009 to February 2018, there were 69 women infected with chickenpox during pregnancy. The incidence of chickenpox during pregnancy over this nine year period in our study was 33.7 in 10000 pregnancies. Out of the 69 pregnant women, 64 were booked cases and 4 were referred from outside. 75.3 % women were of the age group 19-29 yrs. 24.63 % of the women were of the age group 30-40 yrs. The mean age of the patients was 27 years. Of the 69 cases of chickenpox complicating pregnancies, 59.4 % of the cases were primigravida, 34.7% were second gravida and 5.8% were third gravida. Of the 69 women, three women were lost for follow up. 35 women were infected with chickenpox

in their first trimester, 28 in second trimester and 6 in the third trimester. (Table 1) 57 women were treated with acyclovir and 12 women were not

treated with acyclovir and instead had taken homeopathy/ayurveda / no treatment.

Gestational Age	Frequency	Percentage
14wks	35	50.73
14-28wks	28	40.57
28-40wks	6	8.7

Table 1: Percentage of cases infected in different gestational periods

50.7 % of women were infected with chickenpox in their first trimester, 40.57 % in second trimester and 8.7 % in the third trimester.

postvaricella cerebellitis at 18wks gestation, two women had threatened preterm labour at 31 weeks and 34weeks gestation which was managed with tocolysis.(Table 2)

Out of the 69 women with chickenpox during pregnancy, three women had polyhydramnios, one women had preterm labour, 1 women had

Maternal complications	Frequency	Percentage
Polyhydramnios	3	4.3
Preterm labour	1	1.4
Postvaricella cerebellitis	1	1.4
Threatened preterm labour	2	2.8

Table 2: Incidence of maternal complications in pregnant women infected with varicella

Out of the 69 women with chickenpox during pregnancy, three women had polyhydramnios, one women had preterm labour, 1 women had postvaricella cerebellitis at 18wks gestation, two women had threatened preterm labour at 31 weeks and 34 weeks gestation which was managed with tocolysis.

Seven fetus had fetal growth restriction in which one fetus was with congenital diaphragmatic hernia and one with multiple anomalies mentioned above. One fetus had fetal growth restriction with abnormal Doppler. In one women who was carrying a MCDA twin pregnancy, selective fetal growth restriction and Twin Twin Transfusion Syndrome Stage II was found. The woman who developed postvaricella cerebellitis at 18wks gestation had undergone a scan at 23 wks gestation which showed fetal growth restriction and later she was lost for follow up. The women whose fetus had posterior urethral valve with atrioventricular canal defect and one with fetal hydrops were lost for follow up. Out of 66 fetus, six had congenital varicella.(Table 3)

Five women had congenital anomalies in the ultrasound done for evaluating for anomalies after infection with varicella. One fetus had left leg talipes, one had congenital diaphragmatic hernia, one had posterior urethral valve along with atrioventricular canal defect, one fetus had fetal hydrops and one fetus had multiple anomalies like hydrocephalus, ventricular septal defect, bilateral talipes, hand fixed flexion deformity.

Foetal complications	Frequency	Percentage
Congenital anomalies	5	7.24
FGR	7	10
FGR, Abnormal Doppler	1	1.4
FGR, TTTS	1	1.4

Cong.Varicella	Frequency	Percentage
Yes	6	9.09
No	60	90.9

Table 3: Incidence of foetal complications in pregnant women infected with varicella

There were no spontaneous miscarriages in first trimester in our study. The incidence of congenital anomalies was 7.2% and when compared to the overall obstetric population of the nine year study period in which the incidence was 6.5 %, there was no statistical significance in the incidence of congenital anomalies as the p value is 0.99 (> 0.05). The incidence of preterm labour was 4.7% although out of three women, in two women preterm labour was successfully managed with tocolysis and when compared to the overall obstetric population of the nine year study period in which the incidence was 15 %, there was a statistically significant less incidence of preterm labour in our study as the p value is 0.035 (< 0.05). The incidence of polyhydramnios was 4.7% and when compared to the overall obstetric population of the nine year study period in which the

incidence was 1%, there was a statistically significant increase in the incidence of polyhydramnios in our study as the p value is 0.018 (< 0.05). The incidence of fetal growth restriction was 13% and when compared to the overall obstetric population of the nine year study period in which the incidence was 12.4%, there was no statistically significant difference in the incidence of fetal growth restriction in our study as the p value is 0.963 (> 0.05).The incidence of low birth weight was 9.5% and when compared to the overall obstetric population of the nine year study period in which the incidence was 26%, there was a statistically significant less incidence of low birth weight in our study as the p value is 0.004 (< 0.05).(Table 4)

Variable	Case		Control		p value
	N	%	N	%	
Preterm Labor					
Yes	3	4.7	3068	15	0.035*
No	60	95.2	17389	85	

Congenital anomalies					
Yes	5	7.2	1339	6.5	0.99
No	64	92.7	19118	93.4	
Spontaneous miscarriage					
Yes	0	0	3068	15	
No	69	100	17389	85	
Low birth weight					
Yes	6	9.5	5318	26	0.004*
No	57	90.4	15139	74	
Polyhydramnios					
Yes	3	4.7	204	1	0.018*
No	60	95.2	20253	99	
FGR					
Yes	9	13	2557	12.4	0.963
No	60	87	17900	87.5	

*statistically significant at 5%level

Table 4: Comparison of maternal and fetal complications between study group and overall obstetric population

8.8% of fetus of women infected in the first trimester had congenital anomalies. 7.1% of fetus of women infected in the second trimester had congenital anomalies. 16.7% of fetus of women infected in third trimester had congenital anomalies. Out of three women who had polyhydramnios, two were infected in the first trimester and one was infected in the second

trimester. Out of three women who had preterm labour two women were infected in the first trimester and one women was infected in the second trimester. One woman who was infected in the first trimester had post-varicella cerebellitis. (Table 5)

Maternal Complications	Gestational age					
	First		Second		Third	
	N	%	N	%	N	%
Polyhydramnios	2	5.7	1	3.6	0	0
Preterm labour	1	2.9	0	0	0	0
Post-varicella cerebellitis	1	2.9	0	0	0	0
TPTL	1	2.9	1	3.6	0	0

Maternal complications	Gestational age					
	First		Second		Third	
	N	%	N	%	N	%
Yes	5	14.3	2	7.1	0	0
No	30	85.7	26	92.9	6	100

Tabl. 5 : Which group of gestational age at infection was more prone to maternal complications

Out of 35 women infected in first trimester, four fetus had FGR. Of those infected in second trimester, one had FGR, one had FGR with congenital diaphragmatic hernia, one had fgr with abnormal doppler and one had selective FGR with TTTS which was a a twin pregnancy. Out of six

women infected in third trimester, one fetus had FGR. Out of sixty nine women, thirty five delivered vaginally, two delivered with vacuum and twenty six women had cesarean section for various indication. (Table 6)

Fetal Complications	Gestational age					
	First		Second		Third	
	N	%	N	%	N	%
FGR	4	11.4	2	7.14	1	16.7
FGR, Abnormal doppler	0	0	1	3.6	0	0
Selective FGR, TTTS	0	0	1	3.6	0	0

Congenital anomalies	Gestational age					
	First		Second		Third	
	N	%	N	%	N	%
Yes	3	8.8	2	7.1	1	16.7
No	31	91.2	26	92.9	5	83.3

Table.6: Which group of gestational age at infection was more prone to fetal complications

One woman had undergone medical terminations of pregnancy even after her anomaly scan was normal, due to the fear of associated fetal anomalies

with varicella. One woman had undergone termination for FGR with multiple anomalies and another woman with twin pregnancy had

undergone termination of pregnancy for selective fetal growth restriction and TTTS stage II. The mean gestational age at delivery (SD) was 38 weeks (1.5). Five babies had low birth weight, one baby had low birth

weight along with respiratory distress syndrome and glottic synechia. One baby had left leg talipes, one had left undescended testis, one had patent ductus arteriosus and one had ventricular septal defect. (Table 7)

Neonatal complications	Frequency	Percentage
LBW	5	7.2
LBW, RDS, glottic synechia	1	1.4
LEFT LEG CTEV	1	1.4
Left undescended testis	1	1.4
PDA	2	2.8
VSD	1	1.4

Table 7: Incidence of neonatal complications in pregnant women infected with varicella

Discussion

Varicella during pregnancy can lead to maternal infection, intrauterine infection or perinatal infection when the primary disease occurs in the mother around the time of delivery. The incidence of chickenpox during pregnancy in our hospital over this nine years period of study was 33.7 in 10000 pregnancies. This increased incidence would be partially attributed to the high rates of referrals to our hospital as it is a tertiary centre. Two out of the twelve women whose fetus had congenital varicella were not treated with antivirals during their infection with chickenpox virus. The effects of chickenpox infection would have been reduced if antiviral treatment was started soon after the appearance of rash. One woman had undergone termination of pregnancy even after her targeted anomaly scan was normal, due to the fear of associated fetal anomalies and complications with varicella during pregnancy. There is a need for widespread awareness among the patients that prompt treatment, regular screening and followup will reduce the maternal and fetal morbidity due to chickenpox infection during pregnancy and the tendency to undergo termination of pregnancy due to fear of fetal ill effects should be avoided.

Of the six women whose fetus had congenital varicella, three women were infected in the first trimester and three women in the second trimester. In a large series with 1373 pregnancies infected with chickenpox during pregnancy in united kingdom and germany, they found that fetal disease occurred most commonly between 13 and 20 weeks.⁵ In our study, the incidence of congenital varicella was 9% excluding the women lost for followup. This high incidence can be explained by the higher incidence of cases reported to our hospital as said above. Although the reported risks of embryopathy after maternal infection with varicella virus range from 0⁵ to 9.2 %⁶ above the base-line level of risk, this range is derived from small studies.⁷ There is a need for the study of the maternal and fetal effects of chickenpox during pregnancy on a larger sample.

The incidence of preterm labour was 4.5 % in our study. Three women went into preterm labour, in which only one delivered premature fetus and for one elective cesarean was done at 34 wks gestation in view of bad obstetric history with previous cesarean section. The women who had preterm labour at 31wks gestation delivered a 1.16kg baby. Two out of the three women were infected in first trimester and the other women contracted the infection at 23 wks of gestation. This explains the increased predisposition to preterm labour if the women has been infected in the first trimester. There was a trend toward more premature births among the patients who contracted varicella in the first 20weeks with an incidence of 5.6%.⁷ There were no cases of varicella pneumonia in our study. One woman who was infected in the first trimester had postvaricella cerebellitis. Our study shows that there were more maternal complications when the infection occurred in the first trimester with 14.3 % of women infected in the first trimester who had maternal complications.

There was an increased incidence of polyhydramnios, no difference in incidence of preterm labour and low birth weight in our study when compared to the overall obstetric population whereas there was no change

in the incidence of fetal growth restriction and congenital anomalies independently. There were no cases of neonatal varicella. Hence the maternal and fetal complications with chickenpox infection during pregnancy were more when the women were infected in the first trimester. Pre pregnancy immunization with varicella virus vaccine will decrease the incidence of chickenpox infection during pregnancy. There is a need for universal immunization in childhood and pre-pregnancy if not immunized in childhood and has not contracted the disease before pregnancy.

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Declarations

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Conflict of interest: No conflict of interest

Ethical approval: This retrospective observational study has been conducted in accordance with the ethical standards of our institution.

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