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Original Research Article

Maternal and perinatal outcome in multifetal gestation

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ABSTRACT

Background: Multifetal gestation is a high-risk pregnancy associated with increased maternal and fetal complications. The rate of multiple pregnancy has dramatically increased during the past decades, along with the diffusion of assisted reproduction technology (ART). The present study aims to investigate maternal and perinatal outcome in multifetal gestation.
Methods: The prospective study was carried in the department of obstetrics and gynaecology, B. J. medical college, civil hospital, Ahmedabad from August 2019 to July 2020. All cases of multifetal pregnancy either admitted from antenatal clinics or from labor room as emergency cases were included in the study.
Results: Out of total 7786 births during this period, 103 were twin pregnancies and 3 were triplets. The incidence was 1 in 73.5 births. Maternal complications observed were anaemia in 27.3% patients, preterm deliveries in 58% patients, PROM in 20.7% patients, hypertensive disorders of pregnancy in 13.2% patients, APH in 1.8% patients and PPH in 4.7% patients. No maternal mortality occurred. Fetal complications like gross congenital anomalies in 6.13% cases, single fetal demise in 8.49%, growth discordance in 7.53%, fetal growth restriction in 5.18% cases and 82% babies were low birth weight. Still birth rate was 8.01% and perinatal mortality rate was 12.3%.
Conclusions: Early detection of high-risk cases, timely referral, frequent antenatal visits and early hospitalization with optimum obstetrics care and intensive neonatal care set up are necessary to improve maternal and perinatal outcomes.

Keywords: High risk pregnancy, Assisted reproduction technology, Optimum obstetrics care, Intensive neonatal care

INTRODUCTION

"The rarity of plural birth in women and the increased danger to the mother and offspring in these circumstances renders such an event in a certain limited sense a disease or an abnormality"- Mathew Duncan, 1865.

The multiple natural concepts of higher order are rare. The reported incidence ranges from 0.01% to 0.07% of all pregnancies.[1] In recent years there has been a dramatic increase in multiple pregnancies throughout the world. The need for infertility treatment has also been rising sharply due to factors which include the impact of sexually transmitted diseases and the trend towards pregnancy at later age. Undoubtedly, the main factor has been the use of ovulation inducing drugs and of multiple embryo transfer in the treatment of infertility. Multiple pregnancies deserve special attention because they make a considerable contribution to maternal/perinatal morbidity/mortality much greater than that due to the multiplication of the single risk by the number of fetuses.[2,3] Adverse outcomes are more likely, both for the woman and her babies, during the prenatal and intra partum periods. Because of this, women need increased monitoring and more contact with healthcare professionals during their pregnancy.

METHODS

The prospective study of maternal and perinatal outcome associated with multi fetal gestation was carried in the department of obstetrics and gynaecology, B. J. medical college, civil hospital, Ahmedabad from August 2019 to July 2020. All cases of multi fetal pregnancy either

admitted from antenatal clinics or from labor room as emergency cases were included in the study. During this period there were total 7786 deliveries, out of which there were 106 cases of multiple pregnancy of different gestational age.

Detailed history of the patient including age, parity, menstrual history, obstetric history, past, family, personal history was recorded. The clinical, systemic and obstetric examination, with required investigation was done. The time interval between delivery of twins or triplets, the mode of delivery of each baby, the associated complications, type of interference and complication of third stage were recorded. The placenta of all cases was examined and zygosity was determined from studying the separating membranes. Babies' sex, birth weight, Apgar score at 1 and 5 minutes and resuscitation measures if any were noted. Any associated early neonatal comorbidities, death and the causes were determined. The maternal morbidity, if any, was studied. Paediatric consultation was obtained from time to time in the management of neonates.

Statistical analysis was done using Microsoft excel, Yates corrected chi square tool and appropriate statistical tools. Final outcome was given in terms of percentage.

RESULTS

Out of 7786 consecutive deliveries in the period of 12 months, 106 cases of multiple pregnancies were observed. There were 103 twins and 3 triplets. The incidence was 1 in 73.5 births. Majority (46.2%) of mothers with multiple pregnancy were in the age group of 25-30 Years followed by 20-25 years' age group (32.07%). Out of 106 multiple pregnancies, 1.88% of cases had family history of multiple pregnancy, 12.26% of cases had history of infertility treatment taken. Majority of cases (71.6%) were referred from other hospitals.

Around 4.71% cases were found having monochoronicity whereas 89.6% cases have dichorionicity and 2.8% cases have trichorionicity. Half of cases (50%) were delivered between 32 to <37 weeks of gestation (Table 1).

Most common multifetal gestation associated maternal complications found in our study were preterm labour (46%) followed by anaemia (27.3%), preterm prelabor rupture of membranes (20.7%), hypertensive disorders of pregnancy (11%), PPH (4%) and APH (1%). Other complications found at lesser extent were hyperemesis gravidarum and polyhydramnios. Out of 29 patients with anemia, 7 patients (24.1%) needed blood transfusion and main indications for blood transfusion were abruption and PPH. Among 22 cases of PROM, 4 (18.18%) cases were managed conservatively (Figure 1).

Associated fetal complications found in our study, were gross congenital anomalies in 13 cases (6.13%), single fetal demise in 9 cases (8.49%), growth discordance in 8 cases (7.53%), fetal growth restriction in 11 cases (5.18%). Around 82% babies were low birth weight (<2500 gm) which was main cause of NICU admissions, perinatal mortality, sepsis and late complications (Figure 2).

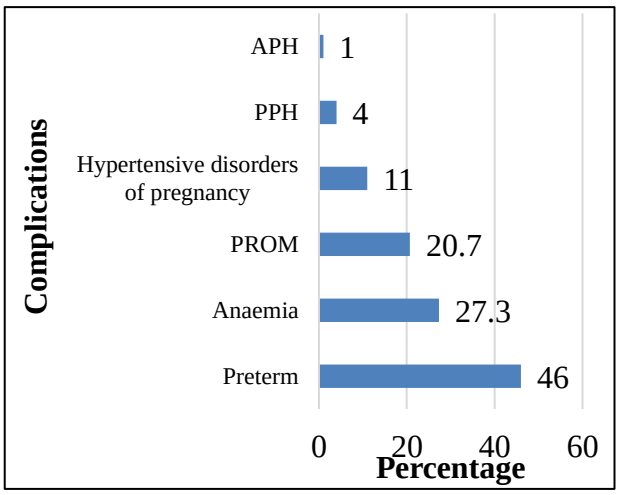

Figure 1: Association of variables with multifetal gestation.

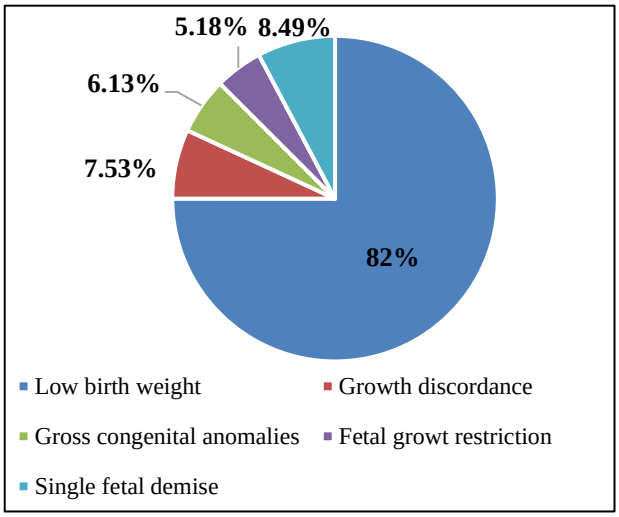

Figure 2: Associated fetal complications.

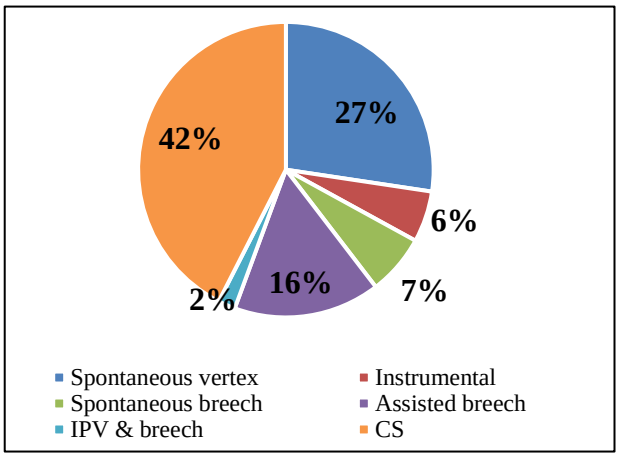

Figure 3: Mode of delivery in multifetal gestation.

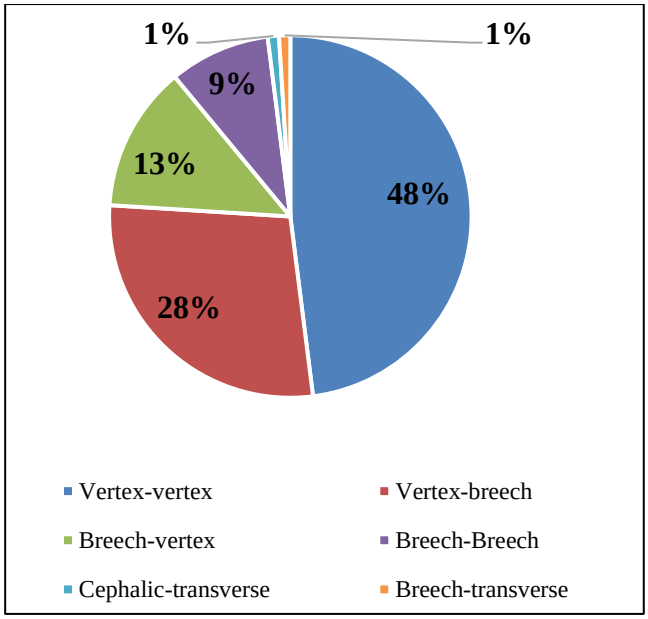

Figure 4: Presentation of fetus in multifetal gestation.

In majority of cases, mode of delivery was caesarean section (42.5%) followed by Spontaneous vertex (27.3%), assisted breech (16.03%), Spontaneous breech (7%), instrumental (6%) and IPV and breech (2%) (Figure 3).

Most common presentation was vertex-vertex (48%) followed by vertex-breech (28%), breech-vertex (13%), breech-breech (9%), cephalic-transverse (1%) and breech-transverse (1%). Zero cases observed for transverse-cephalic, transverse-breech and both transverse presentation (Figure 4).

Presentation of fetus and mode of delivery, these both factors found to be influenced by prematurity, birth weight, RDS, maternal complications and their consequences. RDS was leading cause of death due to prematurity.

Stillbirths were highest in 28-30 weeks of gestational period, which was 44.6% and early neonatal death rate and PNMR were 29.23% and 72.6% respectively in the same age group. In addition, late neonatal deaths and death after 28 days to 2 months of NICU stay also studied. 75% (3 out of 4 deaths) of deaths that occurred after 28 days to 2 months of NICU stay was found in 28-30 weeks of gestation, cause of death in many of them were septisemia, HIE, congenital anomalies in preterm babies. The perinatal mortality in multiple pregnancies is inversely proportional to gestational age. There was progressive decrease in perinatal mortality rate and late neonatal deaths with increased gestational age at time of delivery (Table 2).

Stillbirths were highest in less than 1000 gm of birth weight which was 50.01%. Early neonatal death rate and perinatal mortality rate were also higher in the same group with 29.23% and 77.7% respectively. Stillbirths and mortality rate were zero in more than 2500 gm of birth weight group. Perinatal mortality in multiple pregnancies is inversely proportional to birth weight. There was progressive decrease in perinatal mortality rate and late neonatal deaths with increased birth weight (Table 3).

Table 1: Association of variables with multifetal gestation.

Variables	Frequency (n)	Percentages (%)	Triplets no. (%)
Age group (Years)			
<20	9	8.49	2 (1.88)
20-25	34	32.07	
25-30	49	46.22	1 (0.94)
30-35	8	7.54	
>35	3	2.83	
Conception			
Through infertility treatment	13	12.26	2 (1.88)
Spontaneous	91		
Family history			
Yes	2	1.88	3 (2.83)
No	101	95.28	
Antenatal visit			
Booked	30	28.4	3 (2.83)
Referred	73	68.8	
Placenta			
Monochorionic	5	4.71	
Dichorionic	95	89.6	3 (2.83)
Trichorionic			
Period of gestation (Weeks)			
28-<32	28	26.4	
32-<37	53	50.0	3 (2.83)
≥37	22	20.7	

Table 2: Association of gestation age with perinatal outcome.

Gestational period	Total no. of birth	Total no. of live birth	Total no. of death	Stillbirths no. (rate)	Early neonatal death no. (rate)	Perinatal mortality no. (rate)	Late neonatal death	Death after 28 days, but before 2 months of NICU stay
28-30	52	30	22	8 (44.6)	5 (29.23)	13 (72.6)	6	3
31-33	66	54	12	5 (28.4)	2 (11.69)	7 (39.7)	4	1
34-36	54	49	5	3 (17.24)	1 (5.84)	4 (22.9)	1	0
≥37	40	38	2	1 (5.81)	1 (5.84)	2 (11.6)	0	0
Total	212	171	41	17	9	26	11	4

Table 3: Association of birth weight with perinatal outcome.

Birth weight (gm)	No. of total birth	No. of live births	Still birth		Early neonatal death		Perinatal mortality	
			N	Rate	N	Rate	N	Rate
<1000	42	28	9	50.01	5	29.23	14	77.7
1000-<1500	65	51	5	28.4	3	17.5	8	45.4
1500-<2500	67	54	3	17.2	1	5.8	4	22.9
>2500	38	38	0	0	0	0	0	0
Total	212	171	17		9		26	

DISCUSSION

Incidence

In the present study, there were 103 twin pregnancies and 3 triplets, with an incidence of 13.6/1000 births. Similar results were observed in the Gajera et al study where the incidence was 17.6/1000 births.[10] According to various studies conducted in India, the average rate of multiple pregnancies is 9-16/1000 births.[11] The main factor contributing to multiple pregnancies in this study appears to be the referral of all high-risk cases to our hospital, which is a tertiary care centre.

In the present study, the majority of cases (71.6%) were referred. The contrast result was observed in Gajera et al where 70% of patients were referred.[10]

Maternal age

In the present study, the majority (46.2%) of mothers with multiple pregnancies were in the 25-30 age group. A similar result was observed in Su et al in which the majority (60.6%) of mothers were in the 25-35-year age group.[14] The mean age of the mother was 26 in the Mahendra et al study.[13] A higher incidence in the younger age group in the present study is explicable because early marriage and early pregnancy are prevalent in India. [17] Increase in maternal age at conception, which in turn led to infertility treatments predispose to multiple pregnancy.[6,7]

Family history

In the present study, 1.88% of cases had a family history of multiple pregnancies that was lower than in other similar studies. The family history of multiple pregnancies was 13.09% in Yeasmin et al, 19% in Chowdhury et al and 30% in the Sultana et al studies.[12,16,17]

Artificial reproductive techniques

In this study, 12.26% of cases had a history of infertility treatment. Similar results were observed in Yeasmin et al, Chowdhury et al and Sultana et al in which 10.11%, 17% and 14% of cases resulted from ovulation inducing drugs, respectively.[12,16,17] Iatrogenic multiple pregnancy emphasizes need for transfer of a limited no. of embryos during ART in order to secure singleton pregnancy.

Chorionicity

In the present study, approximately 4.71% of the cases had monochoronicity while 89.6% of the cases had dichorionicity and 2.8% of the cases had trichorionicity. According to the study by Mahendra et al where 67% dichorionic twins and 33% monochorionic twins.[13]

Period of gestation

In the present study, half of the cases (50%) were delivered between 32 and <37 weeks gestation. Similar results were observed in Gajera et al where the majority of patients (46%) gave birth between 33-and 36-week gestation.[10] The most common gestational age at delivery was 29-36 weeks in Hada et al (47.1%) and Veronica et al (55%).[15,18] Thus, incidence of preterm labor is high in multiple pregnancies.

Presentation of fetus

In the present study, the most common presentation was vertex-vertex (48%) followed by vertex-breech (28%).

The most common presentation was vertex in Gajera et al (60%), Hada et al (45.1%) and Yeasmin et al (48.21%).[10,12,15] Sultana et al and Chowdhury et al in their studies found that the majority of the fetal presentation was vertex with 48% and 47.5% respectively.[17,16] Outcome of second twin is more likely to be affected by presentation of the first twin.[8] The most common fetal presentation was the vertex in various studies, probably nature's blessing for vaginal birth.

Mode of delivery

In the present study, the most common mode of delivery was Caesarean (42.5%). A similar rate of caesarean section was observed in Gajera et al (38%), Hada et al (39.6%) and Vernica et al (45%).[10,15,18]

Maternal complications

The most common maternal complications found in our study were preterm delivery (46%) followed by anemia (27.3%), PROM (20.7%), hypertensive disorders of pregnancy (11%), PPH (4%) and APH (1%). Similar results were observed with Su et al in which the most common maternal complications were preterm delivery (53.8%) followed by anemia (31.5%), PIH (19%), PROM (18.2%)) and PPH (17%).[14] In Hada et al the maternal complications found were anemia (37%), PIH (21.8%), PROM (16.4%) and APH (3.7%) which were comparable to this study.[15]

The incidence of preterm deliveries was higher (74%) in Gajera et al and (88%) in Bangal et al.[10,19] Preterm labor was also observed as a common maternal complication in Yeasmin et al (51.44%) and Chowdhury et al (43.4%), which was comparable to the present study.[12,16]

The incidence of anemia was 37% in Hada et al 39.88% in Yeasmin et al and 26% in the Chowdhury et al study.[12,15,16] In Gajera et al and Spellacy et al the incidence of anemia was 7% and 9.4%, respectively.[10,20] The increased incidence of anemia may be due to the high prevalence of malnutrition, unhealthy diet, illiteracy, poverty, lack of awareness of antenatal care, and non-adherence to medications and medications. repeated births, which are common in developing countries.

In Yeasmin et al PROM was observed in 28.32% of cases, according to the present study.[12] However, Chowdhury et al, Sultana et al and Mahendra et al showed PROMs in 3.8%, 10% and 8.6% of patients, respectively, which were unusually low for multiple pregnancies.[16,17,13]

Incidence of hypertensive disorders of pregnancy was higher in Gajera et al (24%), Yeasmin et al (28.9%) and Sultana et al (28%) compared to the present study.[10,12,17] Postpartum hemorrhage was higher in Yeasmin et al (17.34%) and Chowdhury et al (18.9%) compared to the present study.[12,16]

There was no maternal mortality in this study consistent with Yeasmin et al, Mahendra et al, Chowdhury et al and Sultana et al also reported no maternal deaths.[12,13,16,17] The risk of maternal mortality is approximately 2.5 times higher in twin pregnancies than in single pregnancies.[9]

Perinatal complications

In the present study, 82% of infants had low birth weight (<2500 g), the leading cause of neonatal intensive care hospitalization, perinatal mortality, sepsis and late complications. The incidence of having a baby with a low birth rate was 86.9% in Gajera et al and 82% in Bangal et al which was comparable to the present study.[10,19] In Su et al about 46.6% of babies were born low weight.[14] In Yasmin et al low birth weight was the most common indication for neonatal hospitalization.[12]

In the present study, perinatal mortality in the form of neonatal and intrauterine deaths was 15.2%. In the study Gajera et al perinatal mortality in the form of neonatal and intrauterine deaths was 17%.[10] Sultana et al reported a perinatal mortality of 11%.[17] Yeasmin et al observed a perinatal mortality of 39%.[12] Among the obstetric conditions known to increase the risk of perinatal mortality, multifetal pregnancy is a well-known factor.[4,5]

Stillbirths were highest in the 28-30 weeks of the gestation period, which was 44.6%, and the early neonatal mortality rate and perinatal mortality rate were 29.23% and 72.6%, respectively, in the same age group. Perinatal mortality in multiple pregnancies is inversely related to gestational age. Stillbirths were highest for less than 1000 grams of birth weight, at 50.01%. The early neonatal mortality rate and the perinatal mortality rate were also higher in the same group at 29.23% and 77.7% respectively. Perinatal mortality in multiple pregnancies is inversely related to birth weight.

In Hada et al the PNMR relative to birth weight was highest at 1.5 kg, which also shows an inverse relationship between PNMR and birth weight of newborns.[15] Birth weight and gestational age are known to be the most important factors influencing perinatal mortality and are the most important determinants of infant and infant morbidity. Prematurity and low birth weight are the leading cause of perinatal mortality in multiple pregnancies, as in studies by Hanumaiah et al and Kullima et al have also revealed.[21,22]

Study conducted in a tertiary care center, where more number of referred patients and their presentation in late labour limits the higher rate for vaginal delivery compared to operative deliveries.

CONCLUSION

Early detection of high-risk cases, frequent antenatal visits, timely referral and early hospitalization with optimum obstetrics care and good neonatal care set up are

necessary to improve maternal and perinatal outcome. Iatrogenic multiple pregnancy emphasizes the need for the transfer of a limited number of embryos during ART in order to secure a singleton pregnancy.

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