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Original Research Article

Study of neonatal outcome in multiple gestation

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ABSTRACT

Background: Development of more than one fetus inside the uterus is called multifetal gestation or multiple pregnancy. It's a great challenge to the concerned obstetricians, due to late diagnosis and related complications. The main causes of perinatal mortality are prematurity, congenital defects, malpresentations, placental insufficiency and traumatic deliveries. Therefore understanding of twinning phenomenon is needed to improve perinatal outcome of this high risk pregnancy. The aims and objectives were to study fetal outcome in patients with multiple gestation.

Methods: A prospective observational study carried out during the period of 1 year. A total of 200 patients with antenatal clinical and ultrasound confirmed diagnosis of multiple gestation were enrolled for the study. After taking proper consent for the study, proper history, clinical and obstetrical examinations were conducted and findings noted. Mothers and neonates were followed till discharge from the hospital.

Results: Most common presentation was vertex of both foetuses (62.63%). 70.14% patients underwent spontaneous vaginal delivery and 20.32% underwent LSCS with malpresentation being the most common indication of LSCS. 40.70% patients delivered foetuses of opposite sex. 78.89% had dichorionic and diamniotic placenta. 78.89% had binovular twins. 33.66% foetuses had birth weight between 1.6 to 2 kgs (low birth weight). Prematurity was the most common fetal complication (34.91%). Total perinatal mortality rate is 14.21%. Prematurity was most common cause of neonatal mortality. 6.73% are still birth rate. IUGR was the most common cause of still births.

Conclusions: Multiple gestation is a mixed blessing and if successful, allows a couple to rapidly expand their family with a minimum number of pregnancies but it's a great challenge to the concerned obstetricians. Complications due to multiple gestation are associated with adverse maternal outcome.

Keywords: Multifetal gestation, Multiple pregnancy, Neonatal outcome, Neonatal mortality, Perinatal mortality, Still birth

INTRODUCTION

Procreation, the endless quality of reproduction and its regulation bestowed to all living cells by nature, irrespective of species or kind is miraculous. Multiple gestation is a mixed blessing and if successful, allows a couple to rapidly expand their family with a minimum number of pregnancies. But it's a great challenge to the

concerned obstetricians, due to late diagnosis and related complications. Ignorance on the part of patients themselves puts this group in great peril. The incidence of twins was found to occur is 1 in 80 pregnancies, triplets 1 in 6400 (1:80).¹ Nowadays it is becoming a problem of increasing dimensions with the dramatic increase in numbers due to trend towards delayed child bearing and widespread use of assisted reproduction.

Development of more than one fetus inside the uterus is called multifetal gestation or multiple pregnancy, simultaneous development of two fetus (twin) is the commonest, although with newer infertility treatment protocols, development of 3-8 fetus have been reported. Factors influencing the frequency of dizygotic twinning are maternal age, parity, race and ethnicity, conception soon after cessation of oral contraceptives, genetic predisposition and use of fertility enhancing therapies.

The increase in multiple births increases the rate of maternal morbidity and perinatal mortality. The main causes of perinatal mortality are prematurity, congenital defects, malpresentations, placental insufficiency and traumatic deliveries. Therefore understanding of twinning phenomenon is needed to improve perinatal outcome of this high risk pregnancy. Common fetal complications associated with multiple pregnancies are Spontaneous abortion, Cord accidents like Prolapse, Entrapement, Vasa previa, Fetal growth restriction, Fetal growth discordance, Congenital malformations, Asphyxia and still birth, Twin-twin transfusion, Acardiac twins and perinatal mortality.

Several efforts are made to unify all types of contributions on twins into a new branch known as Gamellology.²

The conception, gestation and labour of plural pregnancy certainly a challenge the outcome of which is determined by masterly intervention in antepartum, intra-partum and post-partum period. Thus it is important to conduct the study at this particular place to have awareness of risks and early detection which will guide the interventions. This might make allocation of scarce resources improper and prevent death of mothers of multiple pregnancy and their babies due to complications.

METHODS

A prospective observational study carried out during the period of 1 year from 1st April 2014 to 31st March 2015. A total of 200 patients with antenatal clinical and ultrasound confirmed diagnosis of multiple gestation were enrolled for the study. After taking proper consent for the study, patients were examined and findings noted. Fetal outcome like stillbirth neonatal death noted. If babies are referred, reason for referral and duration of stay in NICU were noted. Data is collected using a predesigned Proforma. Patients both mother and neonates were followed within seven days. Those patients who were discharged early were asked to leave their mobile phone numbers or attend Obstetrics and Gynecology clinic at day seven.

RESULTS

The present study was carried out in Department of Obstetrics and Gynaecology, Shri Vasant Rao Naik Government Medical College and Hospital, Yavatmal

during 1st April 2014 to 31st March 2015. A total of 200 patients with multifetal gestation admitted in this period were included in this study.

Table 1: Presentation of both babies.

Sr. no.	Presentation	No. of cases	Percentage
1	Vertex – vertex	117	62.63%
2.	Vertex – breech	24	12.63%
3.	Breech – Vertex	27	14.21%
4.	Breech – Breech	09	4.73%
5.	Vertex – Transverse	05	2.63%
6.	Breech – Transverse / Oblique	00	00
7.	Transverse – Breech	01	0.52%
8.	Transverse – Vertex	05	2.63%
9.	Transverse – Transverse	00	00
10.	Compound – Vertex (Head + Hand + Cord)	00	00
11.	Breech – Compound	00	00
12.	Vertex – Compound	00	00
13.	Vertex – Fetus Papyraceus	00	00

* 12 abortions are excluded in this table.

Table 2: Distribution of cases A/c to mode of delivery.

Sr. no.	Type of delivery	No. of cases	Percentage
1.	Vaginal delivery	148	79.14%
	Vertex – vertex	104	55.61%
	Vertex – breech	21	11.22%
	Breech – vertex	15	8.02%
	Breech – Breech	07	3.74%
	Transverse – Vertex	01	0.005%
2.	LSCS		
	(a) For both babies	38	20.32%
	Vertex – vertex	34	18.18%
	Vertex – breech	12	6.41%
	Breech – vertex	03	1.60%
	Breech-Vertex	12	6.41%
	Transverse – Vertex	02	1.06%
	Transverse-Breech	04	2.13%
3.	(b) For second baby only	01	0.005%
	only	04	2.13%
	Vertex-transverse	04	2.13%
3.	Obstetric Hysterectomy	01	0.05%

* 12 abortions are excluded in this table.

1 patient certify undelivered.

Incidence of patients with multifetal Gestation during study period was 2.18%. Incidence of twins was 2.14% and triplets 0.032%. Highest incidence was found in the age group 21-25 years (49.5%) and least in the age group >35 years (2.5%). The 21-25 years is the most common child bearing group in our hospital. 22 patients of less than 20 years had twins; this is because of marriage and

conception at an early age in our country. In our study maximum twins were found in 65.5% and next to it were primigravida (60 cases). Grand multigravida constituted 4.5%.

Most common presentation was both babies in vertex presentation i.e. 62.63%. In 73%, first baby was in vertex presentation, in 18% in breech and in 3% in transverse lie. Presentation of second baby in 71.5% was vertex, in 17% breech and in 2.5% transverse lie.

Most of the patients had normal vaginal delivery 79.14% because of prematurity, multipara with good obstetric history. Incidence of LSCS was 20.32%. 1 case had obstetric hysterectomy for rupture uterus.

Table 3: Indications of caesarean section (n=38).

Sr. no.	Indications	No. of cases	Percentage
1.	Malpresentations	22	57.89%
2.	Fetal distress	04	10.52%
3.	Non progress of labour	03	7.89%
4.	Previous 2 LSCS with scar dehiscence	03	7.89%
5.	Previous caesarean with decreased scar thickness	02	5.263%
6.	Obstructed labour	02	5.263%
7.	Major placenta previa	01	2.63%
8.	Previous caesarean with PROM	01	2.63%

Table 4: Sex distribution.

Sr. no.	Sex	No. of cases	Percentage
1	Both Male	55	27.63%
2.	Both females	63	31.65%
3.	Different	81	40.70%

Table 5: The type of the placenta.

Sr.no.	Type of placenta	No. of cases	Percentage
1	Dichorionic – Diamniotic	157	78.89%
2.	Monochorionic-Diamniotic	32	16.08%
3.	Monochorionic-Mono-amniotic	10	5.02%
	Total	199	

* 1 patient certify undelivered

Commonest indication for caesarean in our study was Malpresentation 57.89%, out of which Breech in 1st baby accounts for 2.63% and transverse lie in 1st baby accounts for 13.15%. In the remaining cases, breech vaginal delivery was preferred most commonly because of marked prematurity congenital malformation, multipara

with good obstetric history and in those who came with cervix nearly fully dilated.

Out of 401 babies, 52.36% were females and 47.63% were males.

Out of 199 cases, 78.89% had diamniotic dichorionic placentas and 16.058% had monochorionic diamniotic placenta. Ratio of Di-Di-Mo-Di comes to be 4.485:1. The type of placenta was diagnosed by naked eye examination only.

Table 6: The type of twins.

Sr. no.	Type of twin	No. of cases	Percentage
1	Binovular	157	78.89%
2.	Uniovular	42	21.10%

All the babies in which placenta was Di-Di were considered as binovular and with Mo-Di placenta as uniovular. The classification was done taking into consideration the appearance of placenta and sex of babies. In our study the ratio is binovular to uniovular twins was found to be 4.485:1.

Table 7: Weight of babies.

Weight of babies (in kgs)	1 st Baby	2 nd baby	3 rd baby	Total No.	Percentage
<1	22	24	01	47	11.72%
1.1-1.5	35	42	0	79	19.70%
1.6-2.0	60	75	00	135	33.66%
2.1-2.4	40	26	00	66	16.45%
2.5	13	08	00	21	5.23%
2.6-3.0	04	03	00	07	1.74%

Table 8: Fetal complications.

Sr. no.	Complications	No. of cases	Percentage
1	Prematurity	140	34.91%
2.	Intrauterine growth retardation	130	32.41%
3.	Intrauterine fetal death	27	13.5%
4.	Congenital malformation	08	4.0%
5.	Birth asphyxia	15	7.5%
6.	Hyaline Membrane disease	30	15.0%
7.	Septicemia	15	7.5%
8.	Cord prolapse	06	1.49%
9.	Abortions	12	6%

In our study, out of 401 babies, only 6.98% were having weight ≥ 2.5 kg while 93.01% babies were < 2.5 kg. Out of 373 babies, 33.78% were very low birth weight < 1.5 kg

and 12.60% were incredibly low birth weight (<1.5 kg). I.e. about 90.5% babies are low birth weight babies in our study.

93.01% were LBW. The main factors responsible for LBW were IUGR and prematurity, IUGR affected 32.41% cases and prematurity 34.91% cases. Intrauterine death occurred 24 babies (6.73%). Cord prolapse was found in 6 babies 1.49%. RDS was found in 30 babies (15%), 8 babies (4%) had congenital anomalies. Septicemia was present in 15 babies which accounts for 7.5%, all which were preterm. Abortions account for 6% in our study.

Table 9: Analysis of perinatal mortality.

Sr. no.	Perinatal outcome	No. of cases	Percentage
1	Total no. of babies	401	
2.	Total no of stillbirth	27	6.73%
3.	Total no. of neonatal deaths	30	7.48%

- Total perinatal mortality= 57.
- PNM%= 14.21% consisting of SB (6.73%) and NND (7.48%)
- PNM in twins recorded in this study as 14.21%.

There was 30 neonatal deaths, Out of which 28 were early neonatal deaths and 2 late neonatal deaths. Out of 2 late neonatal deaths, one baby died on 9th day and one on 18th day of birth. Both died of prematurity and septicemia.

Table 10: PNM reported in various series are.

Study	PNM%
Guttamacher 1936 ⁽¹³⁾	31%
Patel and Patel 1963 ⁽⁴⁾	31.4%
Joseph 1964 ⁽¹⁴⁾	34.4%
Jacob and Bhargava 1973 ⁽⁵⁾	31.8%
Sarojini (2014) ⁽⁷⁾	16.7%
Gandye LM (2013) ⁽¹⁰⁾	9.4%

Table 11: Analysis of still births.

Sr. no.	Causes	No. of cases	Percentage
1	IUGR	14	3.49%
2.	Cord Prolapse	02	0.49%
3.	Breech with cord prolapse	02	0.49%
4.	Transverse lie with cord prolapse	02	0.49%
5.	Congenital anomaly	03	0.74%
6.	Abruptio placentae	02	0.49%
7.	Rupture uterus	01	0.24%
8.	Conjoined twins	01	0.24%
	Total	27	6.73%

There were 27 still births which accounts for 6.73 %, 3 macerated still births and 24 fresh still births. In our study main cause of still birth was IUGR (3.49%), cord prolapse (1.47%) congenital anomaly (0.74%), rupture uterus and conjoined twins (0.24%) each.

Table 12: Analysis of neonatal deaths.

Sr. no.	Cause of Deaths	No. of cases	Percentage
1.	Prematurity	12	2.99%
2.	Hypoxic Ischemic encephalopathy in meconium aspiration syndrome	04	0.99%
3.	Neonatal asphyxia	08	1.99%
4.	Congenital malformation	01	0.24%
5.	Septicemia	05	1.24%
	Total	30	7.48%

The most important cause of neonatal death was prematurity (40%).

DISCUSSION

Development of more than one fetus inside the uterus is called multifetal gestation or multiple pregnancy. It's a great challenge to the concerned obstetricians, due to late diagnosis and related complications. Ignorance on the part of patients themselves puts this group in great peril. The increase in multiple births increases the rate of maternal morbidity and mortality.

Most common presentation was both babies in vertex presentation i.e. 62.63%. Chervenak reported 42.5%, Patel 42.5%, babies presenting as vertex-vertex.^{3,4} Vertex-Breech presentation was less common in our series as compared to Chervenak who reported its incidence as 26%, Jacob and Bhargava as 21.8%.⁵ Breech-Vertex incidence is 14.21%, which is comparable to Jacob series (10.23%). Breech-Breech incidence is (4.73%) which is less than 9.3% of Jacob.⁵ Some rare presentations were vertex-transverse 2.63%, Transverse-Breech 0.52% and Transverse-vertex= 2.63%. Katke and Thakre, vertex-vertex presentation of the first coming and after coming twins were the most common presentation (57.812 %), vertex- breech and breech-vertex being second most common, both occurring with equal frequency accounting for 4.687% followed by vertex-transverse and breech-transverse both occurring in 2.343 % cases followed by transverse-breech (1.52%), transverse-vertex (0.78%) and transverse-transverse (0.78%).⁶ Sarojini et al, 55.6% cases presented by vertex.⁷

Most of the patients had normal vaginal delivery 79.14% because of prematurity, multipara with good obstetric history. Incidence of LSCS was 20.32%. 1 case had

obstetric hysterectomy for rupture uterus while Thompson reported incidence of LSCS as high as 45% and Katke and Thakre study had maximum number of vaginal deliveries, twin 1 (53.125 %), twin 2 (50 %), and LSCS was required for 46.875% of twin1 and 50% of Twin 2.⁶ Yuel et al, had 55 % vaginal deliveries and 45% caesarean sections.⁸ In study by Erdemoglu et al, 50.5% had vaginal deliveries and 45% required caesarean section.⁹

Commonest indication for caesarean in our study was Malpresentation (57.89%), out of which Breech in 1st baby accounts for 2.63% and transverse lie in 1st baby accounts for 13.15%. Sarojini et al, reported 42.7% cases with malpresentations.⁷ Katke and Thakre study, Malpresentation in twins (43.75 %) was the major indication for LSCS.⁶ The presence of breech or transverse lie of any of the fetuses increased the chances of LSCS.

Ratio of Di-Di-Mo-Di comes to be 4.485:1. Katke and Thakre, 72.31% has Di-Di type and 25.38% has Di-Mo type and 0.77% had Mo-Mo type of placentation.⁶ Similarly William's text of obstetrics reported that binovular twins account for 2/3rd of all the twins.¹

Determination of zygosity is important as type of twin is related to many complications e.g. TTTS, discordant growth and affects perinatal mortality, which is obviously higher in uniovular twins because of higher incidence of complications. It is recognized that in those cases where a dichorionic diamniotic placenta is seen, all may not be dizygotic twins. This may be confirmed by further investigations like blood grouping, DNA finger printing etc.

About 90.5% babies are low birth weight babies in our study. Gandye LM, in their study showed 78.7% cases had birth weight below 2.5kgs with average birth weight of 2.1kgs.¹⁰ Katke and Thakre, showed 79% patients with birth weight below 2.5kgs. Prematurity and IUGR both are quite common in twins and both of these are important causes of LBW. Tempe and Batra reported incidence of LBGW as 36.84%, Gandye LM, 27.2% patients were premature births.^{10,11}

Katke and Thakre, 49.61% cases were pre-mature births, Followed by 6.13 % of the twins with intrauterine fetal death, 3.906 % twins having poly-hydramnios, 1.562 % having congenital anomaly like hydrocephalous, and other neural tube defects, 1.986% twins had IUGR.⁶

Intrauterine death occurred 24 babies (6.73%). Perinatal mortality was high in second baby mainly due to higher incidence of malpresentation and delay in delivery of second twin. Asphyxia was the next important complication accounts for 7.5%, Cord prolapse was found in 6 babies 1.49% (1 in first baby and 5 in second babies), Jacob Bhargava reported as 1%.⁵

RDS was found in 30 babies (15%) incidence was slightly more in second baby. There is greater risk of RDS in second baby due to birth asphyxia. In our study all the babies who has RDS has maturity less than 34 weeks and all were vaginal deliveries.

A total of 8 babies (4%) had congenital anomalies, out of which 3 babies were SB, 1 had anencephaly, 1 had fetal ascitis and 1 had multiple congenital anomalies with imperforate anus. Other had hydrocephalous, club foot, cleft palate. Jacob Bhargava reported congenital anomaly as cause of death in 1.3% cases, Bhatia in 6%.^{5,12}

Perinatal Mortality rate (%) = 14.21% consisting of SB (6.73%) and NND (7.48%). Sarojini et al, reported 39 perinatal deaths occurred in the present series.⁷ The causes are still birth in 11 cases (28.2%), birth asphyxia in 8 (20.5%) cases, septicemia and IUD in 6 (15.4%) cases each, respiratory distress in 7 (17.9%) cases and congenital anomaly in 1 (2.6%) case. The incidence of congenital malformations was 2.6%. One is a case of hydrocephalus, one is a case of lumbar meningo-myelocoele, two cases of Ventricular Septal Defect (VSD), one twin to twin transfusion and one acardiac twin.

Still births accounted for 6.73 %. Cause of MSB was severe IUGR and conjoined twin. IUGR accounts for 3.49% of still births. The most important cause of neonatal death was prematurity (40%). Most of the authors reported prematurity as the major cause of death e.g. - Guttamacher 85% cases, Jacob and Bhargava 89%, Asphyxia was another important cause of NND 14%.^{5,13} RDS was associated with 14%. Sepsis accounts for 17% in our study. Congenital malformations accounted for 4% in our study. Su RN, had 0.8% cases with congenital anomaly.¹⁵

CONCLUSION

Multiple gestation is a mixed blessing and if successful, allows a couple to rapidly expand their family with a minimum number of pregnancies but it's a great challenge to the concerned obstetricians. Complications due to multiple gestation are associated with adverse neonatal outcome.

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