STUDY OF MATERNAL AND FOETAL OUTCOME IN MULTIPLE PREGNANCY

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ABSTRACT

AIMS AND OBJECTIVES

To determine the incidence of multiple pregnancy (Multifoetal gestation), possible risk factors, ante-partum, intra-partum and post-partum complications and foetal outcome in multiple gestation.

MATERIAL AND METHOD

A clinical evaluation of all cases of multiple pregnancy who were admitted to the Department of Gynaecology and Obstetrics, Umaid Hospital for women and children, Dr. Sampurnanand Medical College, Jodhpur, was done. The study was carried out during the period of one year from January 2014 to December 2014. Cases were defined as women who admitted or delivered at our hospital during second or third trimester. All women were evaluated for antenatal complications, gestation at which complications occurred, mode of delivery and neonatal outcome.

RESULTS

Total number of multiple pregnancy was 237, out of which 232 were twins and 5 were triplets. The rate of multiple pregnancy in the present study is 9.43/1000 birth. Majority of the women were young multiparous; 48.5% of them had preterm labour and 38.7% had anaemia. Pregnancy induced hypertension, premature rupture of membranes and intrauterine growth retardation were the other complications; 48.5% had premature delivery. The incidence of perinatal mortality was 7.6%. Perinatal deaths reported in first baby were 14, 18 in second baby and 2 in third baby; 5 in 178 twin pregnancies. Two mothers died.

CONCLUSIONS

The announcement, "it's twins!" creates excitement and anxiety in the expectant family. Multiple pregnancies are associated with significant antenatal and perinatal complications. Some of these are specific of multiple pregnancy like TTTS, TRAP and intrauterine demise of one foetus, others are encountered more often than in singleton pregnancies. Proper efforts should be geared during the antenatal period toward the prevention of complications and to improve maternal and neonatal outcome.

KEYWORDS

High Risk Pregnancies, Multifoetal Gestation, Pregnancy Outcome, Multiple Pregnancy.

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INTRODUCTION

Multiple pregnancy (Multifoetal gestation) is becoming more frequent as a result of use of ovulation inducing drugs in the management of infertility (Russel, 2003). In Central Africa, there are 18–30 twin sets (or 36–60 twins) per 1,000 live births. In Latin America, South Asia and Southeast Asia, the lowest rates are found; only 6–9 twin sets per 1,000 live births. North America and Europe have intermediate rates of 9–16 twin sets per 1,000 live births (Smits, Jeroen; Christiaan Monden (2011). "Twinning across the Developing World." In Newell, Marie-Louise. PLoS ONE (Public Library of Science) 6 (9): e25239). In India current twin rate is 11.4% births with 3.3% with monozygotic and 8.1% with dizygotic twins (Mac Gillivary). Maternal complications are anaemia, pre-eclampsia, ante-partum haemorrhage, preterm labour and polyhydramnios. Foetal complications are reported to be more in monozygotic pregnancies as compared to dizygotic twins. Prematurity, growth restriction, congenital anomalies, twin- to-twin transfusion, birth asphyxia and birth trauma are the problems faced by the multiple foetuses. Neonatal Intensive Care Unit (NICU) admission is required.

This study was carried out to see the complications associated with multiple gestation and their effect on perinatal outcome.

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METHODS

A study on 237 multiple pregnancies was done from January 2014 to December 2014. This included 232 twin pregnancies and 5 triplet ones. The data regarding history, complete physical and obstetrical examination, antenatal complications, mode of delivery, post-partum problems and neonatal morbidity and mortality in the first week of life were recorded. Results of investigations including complete haemogram, blood grouping and typing, blood sugar, serology for syphilis, markers for viral hepatitis, HIV, routine urine examination, ultrasonography and of other specific investigations were recorded. Data thus obtained were analysed and the results studied.

RESULTS

The rate of multiple pregnancy in the present study is 9.43/1000 birth. Majority of the women were in the age group of 21-25 years (57.3%); 55.3% were multiparous (Table 1 and Table 2).

6.3% patients conceived following use of ovulation induction agents.

Commonest presentation was both baby vertex presentation in 45.14% followed by 23.62% as first vertex and second non-vertex, while in 13.82% presentation of first baby was non-vertex and second baby as vertex; 14.76% cases were with both foetus as non-vertex (Table 3).

Most common antenatal maternal complication is preterm labour in 48.52% cases followed by anaemia 37.13% and hypertensive disorders in 23.62% cases. Other complications are APH 3.7%, hyperemesis gravidarum 4.2%, polyhydramnios 3.3%, gestational diabetes mellitus 0.8%, PROM 16.4%. The incidence of preterm labour (< 37 weeks) was 48.5%. There were 2 maternal deaths in our study. One patient died due to eclampsia with pulmonary oedema and second patient died due to cerebral vein thrombosis following caesarean section (Table 4).

The incidence of vertex vaginal delivery was 32.4%, assisted breech delivery in 22.7% cases, caesarean section in 39.6% and internal podalic version was done in 4 cases for second baby. External cephalic version and internal podalic version was done in 1 and 1 cases respectively for the third baby. Caesarean section was performed in 39.6% cases. The malpresentation was the most common indication in 54.2% cases. Other indications for caesarean section were ante-partum haemorrhage, failed progress, previous caesarean section and abnormal presentation. In 2 (0.8%) cases, caesarean section was performed for second twin after the delivery of first twin for malpresentation in second twin (Table 5).

Commonest post-partum complication was post-partum haemorrhage in 7.5% cases and post-partum infection in 2.5%.

As shown in Table 6, intrauterine growth retardation was 3.23% for twins and 20% for triplets. Congenital malformations occurred in 1.6% cases. Discordant growth was observed in 4.6% cases. The incidence of perinatal mortality was 7.6%. Perinatal deaths reported in first baby was 14, 18 in second baby and 2 in third baby (Table 6).

Sex combination of delivered babies were Male-Male 83 (35.02%), Female-Female 72 (30.37%) and Male-Female 80 (33.75%) (Table 9).

55.7% of the babies had birth weight between 1.5-2.5 kg and 34.9% were >2.5 kg; 22.1% babies required NICU admission and there were 29 perinatal deaths (7.6%). The mean gestational age at delivery was (35.0±3.74). As shown in Table 5. The highest perinatal mortality rate of 242.71/1000 live births occurred in the preterm group, 28–32 weeks, while term babies (>37 weeks) had a perinatal mortality rate of 15.30/1000 births (Table 7).

PNMR regarding the birth weight was highest at 1.5 kg, which shows an inverse 586/1000 live birth in the babies with birth weight <1.5 kg and 24.89/1000 in 1.5-2.4 kg birth weight. Perinatal mortality was least in ≥2.5 kg weight babies of 6.53/1000 live birth (Table 8).

Age Group (Years)	No.	Percent
≤20	37	15.61
21-25	136	57.38
26-30	54	22.78
31-35	7	2.95
36 and Above	3	1.26

Table 1: Age Distribution of the Patients

Gravidity	No.	Percent
1	106	44.72
2	42	17.72
3	48	20.25
≥4	41	17.29

Table 2: Correlation of Gravidity Related to Multiple Pregnancy

Foetal Presentation	No.	Percent
Vertex-Vertex	107	45.14
Vertex-Breech	50	21.09
Vertex-Transverse	6	2.53
Breech-Vertex	32	13.5
Transverse-Vertex	1	0.42
Breech-Transverse	7	2.95
Breech-Breech	28	11.81
Transverse-Transverse	0	

Table 3: Distribution of Cases According to the Presentation of Foetus During Labour

Antenatal Complication	No.	Percent
Anaemia	88	37.13
Preterm Labour	115	48.52
Hypertensive Disorders	56	23.62
Ante-Partum Haemorrhage	9	3.79
Hyperemesis Gravidarum	10	4.21
Polyhydramnios	8	3.37
Gestational Diabetes Mellitus	2	0.84
Premature Rupture of Membranes	39	16.45
Spontaneous Abortion	4	1.68
Intrahepatic Cholestasis of Pregnancy	1	0.42

Table 4: Percent Distribution of Antenatal Complication

Indication	No.	Percent
Malpresentation	52	55.31
Previous Scar	14	14.89
Foetal Distress	7	7.44
Hypertension	2	2.12
Non-Progress	1	1.06
APH	4	4.25
IUGR	1	1.06
Monozygotic	1	1.06
Failed Induction	2	2.12
Obstructed Labour	3	3.19
CPD	1	1.06
TTTS	1	1.06
Interlocking of Twin	1	1.06
Elective	4	4.25

Table 5: Indication of Caesarean Section (n-94)

Factors	Twins (n=464)		Triplets (n=15)	
	No.	Percent	No.	Percent
Respiratory Distress	36	7.75	4	26.66
Admissions to NICU	101	21.76	5	33.33
IUD	28	6.03	2	13.33
Early Neonatal Death	28	6.03	1	6.66
IUGR	15	3.23	3	20
TTTS (n=232)	2	0.86		
TRAP (n=232)	1	0.43		
Congenital Malformation	4	0.86	0	
Still Birth	4	0.86	1	6.66
Prematurity	216	46.55	9	60
Complete Abortion (n=232)	4	1.72		

Table 6: Distribution of Foetal Complication in Multiple Pregnancy

Gestational Age (Weeks)	No. of Live Births	No. of Death in First Baby	No. of Death in Second Baby	No. of Deaths in Third Baby	Perinatal Mortality/ 1000 Live Birth
28-32	103	7	15	3	242.71
33-36	141	1	1	0	14.18
≥37	196	1	2	0	15.30

Table 7: Perinatal Death in Relation to the Gestational Age at Delivery

Birth Weight (kilo grams)	First Baby No. of Live Birth	No. of Deaths	Second Baby No. of Live Birth	No. of Deaths	Third Baby No. of Live Birth	No. of Deaths	Perinatal Mortality/ 1000 Live Birth
<1.5	22	11	23	14	1	2	586.95
1.5-2.4	114	3	124	3	3	0	24.89
≥2.5	82	0	71	1	0	0	6.53

Table 8: Perinatal Death in Relation to the Birth Weight

Sex Combination	No. of Babies	Percent
Male-Male	83	35.02
Female-Female	72	30.37
Male-Female	80	33.75
Could not be Determined	2	0.84

Table 9: Sex Combination (n=237)

DISCUSSION

Incidence of multiple pregnancy reported by various authors per 1000 birth is as follows Sheela et al[1] (2014) 26. AA Kullima.[2] (2014) 23. Indira et al[3] (2013) 20.3, Colla et al[4] (2001) 16, Naushabha et al[5] (2010) 14.4 and in our study 9.4. Relatively lower incidence of multiple pregnancy is reported in our study, because the cases included in our study were only those above 14 weeks of gestational age.

In our study, the incidence of multiple pregnancy is maximum 57.38% in 21-25 years' age group. The mean maternal age was (24.61±4.2) years. Our study coincide with Yuel Veronica Irene et al[6] (2007). The mean maternal age was (27±2) years reported by Yuel Veronica et al (2007). Naushaba Rizwan (2010) reported highest incidence in women age group between 31–40 (54.1%), which reported that bearing children at older age results in multiple gestations. More incidence in younger age group in present study is explainable as early marriages and early child bearing is prevalent in India. Most of the women do not wait for spontaneous conception even for one year of marriage and they opt for ovulation induction at earlier age.

Frequency of multiple pregnancy was 44.7% in primigravida and 55.3% in multigravida in our study. The generally agreed view of a direct relationship between parity and twinning rate has not been found in this study. Instead we discovered that most of the multiple births occurred in lower parity (Para 0–2), which accounted for 82.70%. Jules et al (1955) reported 42% incidence in primigravida and 48% reported by Yuel Veronica (2007). So incidence of multiple pregnancy are more in multipara in various studies.

In the present study, 6.32% of nullipara conceived after ovulation induction. Our study rate coincides with Sheela et al (2014), Dickey (1992) and Catalán BI et al[7] (2011) study. Incidence of ovulation induction were high in Yuel Veronica et al (2007) study 28%.

Most common presentation was both baby as vertex in 45.1%, vertex breech in 21%, vertex–transverse in 2.5%, breech-cephalic in 13.5%, breech-breech in 11.8%, transverse-cephalic in 0.4% and breech transverse in 2.9%. Transverse-transverse presentation was not reported in our study. Commonest foetal presentation was both twins in vertex presentation in various studies, probably nature's blessing for vaginal delivery.

Incidence of preterm labour is 48.5% in our study. Our findings tally with Sheela et al (2014), Pons et al[8] (1998) and Rattan et al[9] (1986). Higher incidence was reported by Colla (2001) and Naushaba Rizwan (2010).

Incidence of anaemia is 37% in our study. Incidence of anaemia were high in Naushaba Rizwan (2010) and

Agustin.[10] (2000) study. Colla et al (2000) reported low incidence of anaemia. The higher incidence of anaemia in above study may be due to high prevalence of malnutrition, improper diet, illiteracy, poverty, lack of awareness of antenatal care and non-compliance to drugs and repeated births, which are prevalent in developing countries.

In the present study, incidence of hypertension and eclampsia is 21.8% and 1.68% respectively. Incidence of pregnancy induced hypertension reported by Yuel Veronica (2007), Sibai.[11] (2000) and Sheela et al (2014) coincides with our study. Rizwan (2010) reported higher incidence than our study. Agustin (2000) reported 11% incidence, which are lower than our study.

In our study, there were 3.7% cases of APH. Abruptio placentae was found in 2.95% and placenta previa in 0.84% cases. Our study rates tally with Sheela et al, Yuel Veronica (2007), Colla et al (2001) and Augustin (2000) study. Incidence of APH reported by Naushabha Rizwan (2010) and Qamar-u-Nisa et al (2013) are slightly higher than our study.

Premature rupture of membranes was observed in 16.45% cases. Our study rate coincides with Yuel Veronica (2007). Incidence reported by Sheela et al (2014) and Agustin (2000) are less than our study. Gardner (1995) reported 22% incidence, which are higher than our study.

In our study, most common gestation age at delivery was 29-36 weeks in 47.1% cases. Yuel Veronica (2007) observed 29-36 weeks as most common gestational age in 55% cases. In study of Sheela et al (2014) most common gestational age at the time of delivery was 32-36 weeks in 67% cases. So the incidence of preterm birth is high in multiple pregnancy.

In our study, out of the 237 women 60.75% (144/237) delivered vaginally. Majority of them came with established preterm labour in early third trimester. The remaining 39.6% (94/237) had caesarean delivery. Malpresentation was the commonest indication necessitating caesarean delivery in 52 (55.31%) women followed by twin pregnancies with previous scar and acute foetal distress. In two cases caesarean section was done for second twin due to malpresentation of second twin.

In our study vaginal delivery was more common for first twin. Caesarean section rate in study of Sheela et al (2014) was 40.3% and commonest indication was malpresentation. In the study of Yuel Vernica out of the 200 women 55% (110/200) delivered vaginally. The remaining 45% (90/200) had caesarean delivery. Malpresentation was the commonest indication necessitating caesarean delivery.

Majority of cases delivered vaginally in our study, because most common presentation was first twin as vertex during labour and trial of labour was given irrespective of presentation of second twin in majority of cases.

65.39% cases have like sex twins and 33.75% have unlike sex twins. Male-to-female ratio was 1.07 (163:152). AA Kullima (2014) observed 68.9% like sex twins and 31.7% of unlike sex twins. Male-to-female ratio was 1:1.

Incidence of post-partum haemorrhage in the present study is 7.59%, which is nearly similar to Sheela et al (2014). Most common cause of PPH was atonic uterus. Incidence of PPH reported by Augustin (2000), Naushabha (2010), Masuda.[12], Shunji Suzuki et al[13] (2006) and Qamar-u-Nisa et al (2013) are higher than our study. AA Kullima (2014) reported 3.8% incidence, which are lower than our study.

The lower incidence of post-partum haemorrhage in our study may be related to the use of active management of third stage of labour routinely practiced at our institution. Early diagnosis and timely prophylaxis also reduces incidence of PPH.

The incidence of maternal morbidity including antenatal, intra-partum and post-partum complications in our study is 70.8% (168/237). Yuel Veronica (2007) reported 82% and Masuda (2002) 84% incidence of maternal morbidity.

When perinatal outcome was analysed, prematurity and low birth weight baby was major problem in patients with multiple pregnancies, majority 56.1% presented between 22-36 weeks of gestation, 42% came in labour at 37 weeks or above; 51.8% of first baby had birth weight between 1500 to 2500 grams and 55.66% second baby had birth weight between 1500 to 2500 grams.

Incidence of prematurity reported in our study is 56.1% and coincides with study of Qamar-u-Nisa et al (2013) having 50% incidence and Fernando Arias (textbook of high risk pregnancy) of 57%. Incidence reported by AA Kulliman (2014) 65%, Masuda (2002) 32%, Naushabha (2010) 84.3% which are very higher than our study.

Perinatal deaths are similar to that observed by Indira Hanumaiah (2013), Sheela et al (2014) and AA Kullima (2014).

The mean gestational age at delivery was (35.0±3.74) weeks. Most of admissions in neonatal nursery and neonatal deaths were due to complications of prematurity.

APGAR score <7 for first, second and third baby was 22.9%, 24.7% and 50% respectively in our study. Our finding coincides with Indira Hanumaiah (2013). Incidence of low APGAR at 5 minutes reported by Pons (1998), Harle.[14] (2002) and Masuda (2002) are less than our study.

It is well known that birth weight and gestational age are most important factors affecting perinatal mortality and are the most significant determinants of infant and childhood morbidity. Prematurity and low birth weight are the leading cause of perinatal mortality in multiple pregnancy as was also revealed by studies of Indira Hanumaiah (2013), AA Kullima (2014).

PNMR regarding the birth weight was highest at 1.5 kg, which shows an inverse relationship of PNMR and birth weight of neonates.

Most common factor contributing to perinatal mortality was prematurity. TTTS and TRAP which are unique complications of multiple pregnancy contributes to PNMR of 11.3/1000 births.

CONCLUSION

The announcement, “it’s twins!” creates excitement and awe in the expectant family. The rate of multiple births shows a steady rise, which can be explained in part by the increasing use of assisted reproductive technology, increasing use of ovulation induction agents and increasing maternal age. Multiple pregnancies are associated with various antenatal and perinatal complications. Some of these are specific of multiple pregnancy like TTTS, TRAP and intrauterine demise of one foetus, others are encountered more often than in singleton pregnancies. Considering that foetal prematurity and low birth weight, sequelae to preterm labour are the commonest causes of perinatal death in this study, efforts

should be geared during the antenatal period toward the prevention of premature birth.

RECOMMENDATIONS

1. Our general public needs to be educated about the importance of early antenatal booking and proper follow-up to reduce the risk to the mother and the babies.
2. There should be a comprehensive program to make Dais and the Trained Birth Attendants (TBAs) aware of the complications associated with twin gestation and the need of proper referral to appropriate centres.
3. Increased iron and folic acid supplementation and additional caloric intake.
4. Selective use of home uterine activity monitoring and tocolysis.
5. Serial ultrasonography for foetal growth. All these measures increase the chances of baby to take home.
6. Weekly ante-partum foetal surveillance beginning at 28-30 weeks gestation.
7. Liberal hospitalization for evidence of preterm labour or gestational hypertension.
8. Delivery at a centre with a level 3 nursery.
9. Improving on existing neonatal services to cater for the neonates at the critical period of their life will significantly reduce the associated morbidities and mortalities.

ABBREVIATIONS

TTTS – Twin-to-Twin Transfusion Syndrome.
TRAP - Twin Reversed Arterial Perfusion.
PROM - Premature Rupture of Membrane.
APH - Ante-Partum Haemorrhage.
PPH - Post-Partum Haemorrhage.
NICU - Neonatal Intensive Care Unit.
PNMR - Peri-Natal Mortality Rate.
IUGR - Intrauterine Growth Retardation.
CPD – Cephalo-pelvic Disproportion.
IUD - Intrauterine Death.

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