

Maternal outcome in multiple pregnancies

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Abstract

Background: Twin pregnancies have increased rates of obstetric complications such as preeclampsia, post-partum hemorrhage and preterm birth, which are known risk factors for maternal mortality. Multiple pregnancies in low-resource settings pose higher fetomaternal risk. **Aim:** To study maternal outcome of multiple pregnancy. To study complication of multiple pregnancy. To compare maternal mortality and morbidity among singleton and multiple pregnancy. **Settings:** Study was done at a rural referral medical college Shri Vasantao Naik Government Medical College Yavatmal, Maharashtra. **Study design:** A hospital based prospective cross sectional study was done in the labor ward, postnatal ward and NICU at Tertiary care hospital in India for 2 year period and was studied in the department of Obstetrics and Gynaecology. **Duration of Study:** 2 years. **Study Period:** January 2015 to December 2016 **Participants:** The study population included pregnant women with multiple and singleton pregnancy women. **Sample size:** 100 pregnant women with multiple pregnancy were taken as cases, 100 normal ANC cases were taken as control **Results:** In the present study, 66 % of multiple pregnancy women belonged to 26 – 30 years of age group, 25% were between 18 to 25 years and another 9% were more than 30 years while 54% of Singleton pregnancy women belonged to 26 – 30 years of age group, 34% belonged to 18 to 25 years of age group and 12% were more than 30 years of age and it was statistically not significant.

Key Words: anemia, pregnancy induced hypertension, preterm delivery, antepartum hemorrhage.

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INTRODUCTION

Multiple pregnancy means the simultaneous development of more than one fetus in the uterus. Simultaneous development of two fetuses (twins) is the commonest type, although rarely development of three fetuses (triplets), four fetuses (quadruplets), five fetuses (quintuplets), or six fetuses (sextuplets) may also occur. The incidence of multiple gestation has increased significantly during the last ten years, now accounting for 3% of the live births¹. The two major factors accounting for these increases are the widespread use of ovulation induction drugs and assisted reproductive technologies, and increasing maternal age at childbirth. Although multiples account for only a small percentage of all live

births, they are responsible for a disproportionate share of all the perinatal morbidity and mortality. Prematurity, growth restriction, congenital anomalies, twin-to-twin transfusion, birth asphyxia, and birth trauma are the problems faced by the multiples. Neonatal intensive care unit (NICU) admission is required by one fourth of twins, three fourths of triplets, and virtually all quadruplets. In the presence of congenital anomalies in one fetus, the management decision become complex because the fate of sibling fetuses are necessarily linked. Twins have a fivefold greater risk of dying before their first birthday compared to singletons, while triplets are at an almost 14-fold greater risk. Among the survivors, there is an increased risk of long term mental and physical handicaps. The overall risk of transfer of the mother to an adult intensive care unit shifts from 0.3% with a singleton pregnancy to 3.1% after a twin delivery². Every woman with a high order multiple pregnancy should be counselled about the risk of continuing the pregnancy, the likely management and the offer of multifetal pregnancy reduction (MFPR). Higher. Order multiple pregnancies should be managed in tertiary perinatal centres with a foetal medicine service. Therefore we conducted this study to evaluate maternal outcome in multiple pregnancy in a tertiary care hospital in India.

MATERIAL AND METHODS

A hospital based prospective cross sectional study was done in the labor ward, postnatal ward and NICU at Tertiary care hospital in India for 2 year period and was studied in the department of Obstetrics and Gynaecology.

Study Design: This was a prospective cohort study involving pregnant women with multiple and singleton pregnancies.

Study Period: January 2015 to 30 December 2016.

Study Population: The study population included pregnant women with multiple and singleton pregnancy women.

Data Collection

- Data is collected using a predesigned proforma which is enclosed.

METHODS

- Detailed history of patients.
- Examination of patients.
- Nature, duration and complications of pregnancy and labour.
- Management of pregnancy and labour.
- Fetomaternal outcome.

Per-vaginal examination to note dilatation and effacement of cervix, formation of bag of water, presenting part and its relationship with the pelvis and pelvis adequacy. For each patient haemoglobin, blood group and Rh typing, blood sugar, blood urea, serum bilirubin, serum creatinine, HIV, VDRL, HBsAg, urine examination, USG were done. Special investigations were done in high risk patient. Most of the patients had spontaneous onset of labour, but at the time of decision of caesarean section, indication of caesarean section, intra operative, post operative, per-operative findings were noted, patients was watched carefully for post partum hemorrhage, sex and weight of both babies were noted women was motivated for breast feeding and having a good diet. Mother and neonate were followed till discharge from the hospital. During puerperium pulse, BP, temperature, involution of uterus, lochia and the condition of the breast noted. Any maternal morbidity like fever, post partum hemorrhage, blood transfusion, blood transfusion reaction, shock noted. Maternal mortality with the cause of mortality noted. Fetal outcome like stillbirth neodeath noted. If babies are referred, reason for referral and duration of stay in NICU were noted. All women were advised for contraception method. Patients were discharged from hospital in good physical condition with advice regarding the care of the babies and regular check up.

Study Area

The maternity unit comprises the antenatal ward and labor ward. All mothers who are in labor are usually admitted to the labor ward for delivery and those with antenatal complications are admitted to the antenatal ward. After delivery they are transferred to the postnatal ward for observation and immunization. Babies delivered are admitted to the neonatal unit or the NICU for care or treatment if they have problems otherwise remain with their parents

Sample size

100 pregnant women with multiple pregnancy were taken as cases. 100 normal ANC cases were taken as control

Selection Criteria

Inclusion Criteria: All multiple were matched with four singleton pregnancies women at gestation age of 28 weeks and above coming for delivery on the same day and consented for the study.

Exclusion Criteria: No exclusion criteria.

Sampling techniques: Non probability method was used to recruit all women with multiple pregnancies at 28 weeks of gestation and above. The gestation age was determined by either dates from the first day of the last normal menstrual period or by extrapolations from early obstetric ultrasound or first visit found on the antenatal card when reporting in labour ward. Whenever multiple pregnant women were identified, four pregnant women with singleton pregnancies delivering immediately and subsequently to each multiple pregnant woman were consented for the study. Simple randomization was used for selection and enrolment into the study. If multiple pregnant women was delivered by Caesarean section also four singleton pregnancies delivered by Caesarean section were selected. For any multiple pregnant women having vaginal delivery there were four singleton pregnancies women delivering vaginally selected to compare. Point of entry for controls was after delivery, for every mode of delivery for multiple pregnant women; controls with four similar mode of delivery were randomly selected to enter into the study.

Statistical Analysis

All the collected data was entered in Microsoft Excel sheet and then transferred to SPSS software ver. 17 for analysis. Qualitative data was presented as frequency and percentages and analyzed using chi-square test of fisher's exact test (in case of 2x2 contingency tables). Quantitative data was presented as mean and SD and compared by unpaired t-test or Man Whitney U test (in case of non normal distribution). p value <0.05 was taken as level of significance.

OBSERVATIONS AND RESULT

Table 1: Age Distributions amongst different study group

			Group		Total
			Multiple	Singleton	
Age Group	18 to 25 years	Count	25	34	59
		%Within Group	25.0%	34.0%	29.5%
	26 to 30 years	Count	66	54	120
		%Within Group	66.0%	54.0%	60.0%
	More than 30 years	Count	9	12	21
		%Within Group	9.0%	12.0%	10.5%
Total	Count	100	100	200	
	%Within Group	100.0%	100.0%	100.0%	

Of the 100 multiple pregnancy women, 66% belonged to 26 – 30 years of age group, 25% were between 18 to 25 years and another 9% were more than 30 years. Of the 100 Singleton pregnancy women, 54% belonged to 26 – 30 years of age group, 34% belonged to 18 to 25 years of age group and 12% were more than 30 years of age. This difference in age between the two groups was statistically not significant with p value of 0.223.

Table 2: Gestational age amongst different study group

			Group		Total
GESTATIONAL AGE			Multiple	Singleton	
	less than 37 weeks	Count	24	5	29
		% within Group	24.0%	5.0%	14.5%
	more than 37 weeks	Count	76	95	171
		% within Group	76.0%	95.0%	85.5%
	Total	Count	100	100	200
		% within Group	100.0%	100.0%	100.0%

Of the 100 multiple pregnancy women in our study 24% had gestational age of less than 37 weeks and 76 % had more than 37 weeks. Of the 100 Singleton pregnancy women, 5% had gestational age of less than 37 weeks and 95 % had more than 37 weeks. This difference in gestational age between the two groups was statistically significant with p value of 0.0001.

Of the 100 multiple pregnancy women in our study, 77% were Registered whereas 23% were unregistered. Of the 100 Singleton pregnancy women, 71% were Registered and 29% were unregistered. The statistical difference between the groups was not significant with a p value of 0.333.

Table 3: Registered / Unregistered amongst different study group

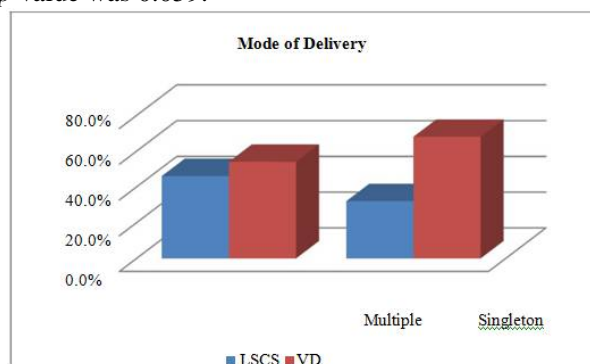
			Group		Total
			Multiple	Singleton	
Registered	NO	Count	23	29	52
		% within Group	23.0%	29.0%	26.0%
	YES	Count	77	71	148
		% within Group	77.0%	71.0%	74.0%
	Total	Count	100	100	200
		% within Group	100.0%	100.0%	100.0%

Of the 100 multiple pregnancy women in our study, 77% were Registered whereas 23% were unregistered. Of the 100 Singleton pregnancy women, 71% were Registered and 29% were unregistered. The statistical difference between the groups was not significant with a p value of 0.333.

Table 4: Parity amongst different study group

			Group		Total
			Multiple	Singleton	
Parity	Multigravida	Count	6	14	20
		% within Group	6.0%	14.0%	10.0%
	Primigravida	Count	94	86	180
		% within Group	94.0%	86.0%	90.0%
Total		Count	100	100	200
		% within Group	100.0%	100.0%	100.0%

Of the 100 multiple pregnancy women, 94% were primigravida and 6% were multigravida. Of the 100 Singleton pregnancy women, 86% were primigravida and 14 % were multigravida. There was no statistically significant difference between the two groups since the p value was 0.059.

**Figure 1**

Of the 100 multiple pregnancy women, 54% had vaginal delivery and 46% had cesarean section. Of the 100 Singleton pregnancy women, 68 % had vaginal delivery and 32% had cesarean section. There was statistically significant difference between the two groups pertaining to the mode of delivery with p value of 0.041.

Table 5: PIH amongst different study group

			Group		Total
			Multiple	Singleton	
PIH	Absent	Count	67	87	154
		% within Group	67.0%	87.0%	77.0%
	Present	Count	33	13	46
		% within Group	33.0%	13.0%	23.0%
		Count	100	100	200
		% within Group	100.0%	100.0%	100.0%

As seen in the above table, 33% multiple pregnancy women and 13% Singleton pregnancy women presented with pregnancy induced hypertension. The difference was significant with p value of 0.001.

Table 6: Anemia amongst different study group

			Group		Total
			Multiple	Singleton	
Anemia	Absent	Count	45	74	119
		% within Group	45.0%	74.0%	59.5%
	Present	Count	55	26	81
		% within Group	55.0%	26.0%	40.5%
Total		Count	100	100	200
	% within group		100.0%	100.0%	100.0%

As seen in the above table, 55% multiple pregnancy women and 25 % Singleton pregnancy women had anemia. The difference was significant with p value of 0.0001.

Table 7: APH amongst different study group

			Group		Total
			Multiple	Singleton	
APH	Absent	Count	91	98	189
		% within Group	91.0%	98.0%	94.5%
	Present	Count	9	2	11
		% within Group	9.0%	2.0%	5.5%
		Count	100	100	200
		% within Group	100.0%	100.0%	100.0%

As seen in the above table, 9% multiple pregnancy women and 2 % Singleton pregnancy women had antepartum hemorrhage. The difference was significant with p value of 0.032.

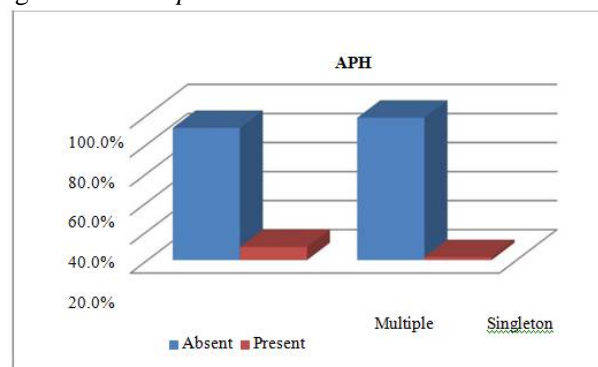


Figure 2

Table 8: Preterm amongst different study group

			Group		Total
			Multiple	Singleton	
Preterm	Absent	Count	76	95	171
		% within Group	76.0%	95.0%	85.5%
	Present	Count	24	5	29
		% within Group	24.0%	5.0%	14.5%
Total		Count	100	100	200
		% within Group	100.0%	100.0%	100.0%

As seen in the above table, 24% multiple pregnancy women and 5 % Singleton pregnancy women had preterm delivery. The difference was significant with p value of 0.0001.

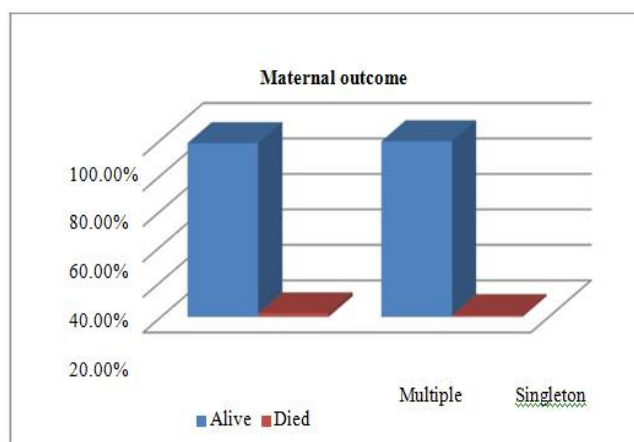


Figure 3

As seen in the above table, Maternal Death occurred in 2% multiple pregnancy women and 1 % Singleton pregnancy women. The difference was insignificant with p value of 0.09.

DISCUSSION

The World Health Organization (WHO) estimates that 99% of the world's annual 287,000 maternal deaths and 3 million neonatal deaths occur in developing countries.^{3,4} Due to inherent biological factors, twin pregnancies have increased rates of obstetric and perinatal complications such as preeclampsia, post-partum hemorrhage and preterm birth⁵⁻⁸, which are known risk factors for maternal and perinatal mortality. Multiple pregnancies in low-resource settings pose higher fetomaternal risks due to a scarcity of human and material resources, which translate into insufficient care during pregnancy and delivery. In the present study, 66 % of multiple pregnancy women belonged to 26 – 30 years of age group, 25% were between 18 to 25 years and another 9% were more than 30 years while 54% of Singleton pregnancy women belonged to 26 – 30 years of age group, 34% belonged to 18 to 25 years of age group and 12% were more than 30 years of age and it was statistically not significant. This findings is in agreement with the study conducted by Katke RD *et al.*,⁹ in which maximum number of patients belonged to age group of 20 - 30 years (90.76%). Similar findings were observed in study conducted by Yuel *et al.*¹⁰ (87.5%). The differences in age could in part be explained by the fact that advanced maternal age are physiologically more likely to have multiples birth and again the possibility of using fertility treatment¹¹. In the present study, 24% of multiple pregnancy women had gestational age of less than 37 weeks and 76 % had more than 37 weeks, while 5% of Singleton pregnancy women had gestational age of less than 37 weeks and 95 % had more than 37 weeks. And this was statistically significant. Similarly in the study conducted by Katke RD *et al.*⁹ most of the twins are delivered between 33 - 36 weeks (48.43%). In the present study, 77% of multiple

pregnancy women were registered whereas 23% were unregistered while in Singleton pregnancy women, 71% were registered and 29% were unregistered. In the present study, in multiple pregnancy women, 94% were primigravida and 6% were multigravida while in singleton pregnancy women, 86% were primigravida and 14 were multigravida. Similarly in the study conducted by Sheela S R *et al.*,¹² observed similar incidence of twins among primi and multigravida whereas study by Chaudhary S *et al.*,¹³ reported that twins were more common in multigravida (64.2%) as compared to primigravida (35.8%). In the present study, cesarean delivery was done in 46% of multiple pregnancy women as compared to 32% of singleton pregnancy women and this difference was statistically significant. This findings is in agreement with the study conducted by Erdemoglu *et al.*,¹⁴ 50.5% had vaginal deliveries and 45 % required caesarean section. Similarly in the study conducted by Arora GG *et al.* the incidence of LSCS was 20.32%.¹⁵ In the present study, 33% multiple pregnancy women and 13% Singleton pregnancy women presented with pregnancy induced hypertension. The difference was significant with p value of 0.001. Similarly in a study done in Washington, USA reported that, multiple pregnancies remained at all time risk of developing pre eclampsia^{16,17}. These findings were comparable with the study done in Netherland¹⁶. The large placenta in multiple pregnancies probably exposes mothers to more paternal antigen and placental secreted pregnancy hormones which are likely to contribute to pre eclampsia and eclampsia in multiple pregnant. In the present study, 24% multiple pregnancy women and 5 % Singleton pregnancy women had preterm delivery. The difference was significant with p value of 0.0001. This finding was also similar to the study conducted in United Kingdom which reported that

more than 50% of multiple pregnancies had delivery before 37 weeks¹⁸. Probably, the most likely reason for preterm labour could be physiological stimuli to the onset of labour, uterine over distention, placental corticotrophin-releasing hormone and lung maturity factors, may be stronger in multiple pregnancies due to the increased fetal and placental mass as described by previous studies conducted elsewhere¹⁸. In the present study, maternal complications like anemia, pregnancy induced hypertension, preterm delivery, antepartum hemorrhage was observed in 55%, 33%, 24% and 9% of multiple pregnancy women, while in Singleton pregnancy women it was present in 25%, 13%, 5% and 2% respectively and this difference was statistically significant. This finding is in agreement with the study conducted by Rajeshwari Ranawat *et al.*,¹⁹ the commonest associated maternal complication observed was anemia (60%) followed by preterm labour (53.3%), premature rupture of membranes (40%), pregnancy induced hypertension (33.3%). Similar results were seen by Bangal, *et al.*²⁰. Similarly in the study conducted by Naushaba Rizwan *et al.*,²¹ Major maternal complication were preterm labour and premature rupture of membranes (84%), Anemia (65.6%), PIH (31.2%), Abruptio placentae (6.2%) and postpartum hemorrhage in 12.5%. In the present study, Maternal Death occurred in 2% multiple pregnancy women and 1 Singleton pregnancy women. The difference was insignificant with *p* value of 0.09. One Nigerian study reported no maternal death while similar study in Malawi reported maternal death of 11.5% among multiple pregnancies²². Probably, the differences in antenatal care between the two populations could account for the observed differences. In the present study, fetal death occurred in 9% multiple pregnancy women and 2% Singleton pregnancy women. The difference was significant with *p* value of 0.03.

SUMMARY AND CONCLUSION

- Sixty six percent of the multiple pregnancy women belonged to 26 – 30 years of age group, 25% were between 18 to 25 years and another 9% were more than 30 years while 54% of the Singleton pregnancy women belonged to 26 – 30 years of age group, 34% belonged to 18 to 25 years of age group and 12% were more than 30 years of age.
- Twenty four percent of the multiple pregnancy women had gestational age of less than 37 weeks compared to 5% of the singleton pregnancy women
- 77% of the multiple pregnancy women were registered and 23% were unregistered while in.

Singleton pregnancy women, 71% were registered and 29% were unregistered.

- 94% of the multiple pregnancy women were primigravida and 6% were multigravida. While in Singleton pregnancy women, 86% were primigravida and 14 % were multigravida.
- 54% of the multiple pregnancy women had vaginal delivery and 46% had cesarean section while in Singleton pregnancy women, 68 % had vaginal delivery and 32% had cesarean section. There was statistically significant difference between the two groups pertaining to the mode of delivery with *p* value of 0.041.
- 26% of multiple pregnancy women and 11% Singleton pregnancy women presented with preterm premature rupture of membranes. The difference was significant with *p* value of 0.006.
- Maternal complications like anemia, pregnancy induced hypertension, preterm delivery, antepartum hemorrhage was observed in 55%, 33%, 24% and 9% of multiple pregnancy women while in Singleton pregnancy women it was present in 25%, 13%, 5% and 2% respectively and this difference was statistically significant.

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