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Original Research Article

Maternal fetal outcome in multiple versus singleton pregnancies delivered in a teaching hospital

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ABSTRACT

Objective: To compare the maternal and fetal outcome in multiple versus singleton pregnancies in a private teaching hospital in India.**Materials and Methods:** Prospectively collected data on 50 twin deliveries from July 2018 to November 2021 were studied to determine its incidence; the maternal and foetal outcome, and compared with 50 singleton deliveries conducted on same day following the twin delivery who served as controls, the twins were also analysed on the basis of chorionicity.**Results:** A total of 3415 deliveries were conducted during the study period, of which 50 were twin deliveries, giving an incidence of 14 per 1000 births or 1.4:100 deliveries. Six among 50 twins resulted following ovulation induction. Women with twin gestation had a mean maternal age of 24.7±3.71, same for the singleton mothers was 24.26±3.7years; mean gestational age at delivery for twins and singletons were 35.38±2.6 and 38.63±1.19 weeks; mean birth weight for twins and singletons were 2.193kgs and 2.85±0.46kgs, mean parity were 2.04± 1.0 and 1.72±0.7 respectively. Parity, gestational age, NICU stay characteristics showed p value < 0.05. Compared with singletons, women with twin gestations had a positive risk association with odds >1 for anaemia, preeclampsia, preterm labour, malpresentation and caesarean delivery. Twin Neonates suffered prematurity, low birth weight, congenital anomaly, prolonged NICU care and increased perinatal death. Neonatal risk was more among monochorionic twins than dichorionic twins. There were 3 cases with single fetal demise, and both fetuses IUD in another case, (total IUDs-5), one twin was still born, two had early neonatal death and there were two late neonatal (>7 Days) deaths. One twin mother threw fits on the 6th postpartum day. Another mother received 20 units of blood and component replacement and subtotal hysterectomy for PPH.**Conclusion:** Despite improvement in antenatal and neonatal care, twins pose a higher threat to MCH outcome. Hence, thorough counselling, patient awareness, more vigilance at interpretation of antenatal tests, intrapartum monitoring and bridging the gap between demand and supply at NICU facility can improve maternal and neonatal outcome; as well as can help parents cope with the psychological stress.This is an Open Access (OA) journal, and articles are distributed under the terms of the [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License](https://creativecommons.org/licenses/by-nc-sa/4.0/), which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.For reprints contact: reprint@ipinnovative.com

1. Introduction

Multiple births are much more common today than in the past. According to the US Department of Health and Human Services, the twin birth rate has increased by over 75% since 1980, and triplet, quadruplet, and high-

order multiple births have increased at an even higher rate. This is in part because more women are receiving fertility treatment as well as having pregnancy at an advanced age.¹ The incidence of multiple pregnancies varies significantly among different races, regions, countries and populations. Smith et al reported that India has twinning rates below 9 per 1000 births² and the incidence of twinning has increased marginally in the last fourteen years (Not more than 0.84 per

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1000 births).³

In 2015, the overall multifetal birth rate was 34.5 per 1000, with twins representing nearly 97 percent of these births as stated by J. Whitridge Williams.⁴

Twin pregnancy has been attributed to increasing maternal, fetal and neonatal complications especially in terms of maternal anemia, hypertensive disorders, preterm birth, polyhydramnios, antepartum and postpartum hemorrhage; as well as prematurity, low birth weight, congenital anomaly and perinatal death.

Hence, this study was undertaken to know the incidence of twin gestation and to study the maternal and fetal complications when compared to singleton pregnancies.

2. Materials and Methods

This was a prospective observational and case control study between twin deliveries (cases) beyond 24 gestational weeks and demographically matched singleton deliveries (controls) immediately following those twin births, were carried out in a private medical college in north-eastern Andhra Pradesh. Data were collected from the delivery log book and case records of twin deliveries beyond 24 gestational weeks, entered into a predesigned excel sheet on maternal age, parity, antenatal medical and obstetric complications, gestational age at birth, birth weight, postpartum maternal and neonatal complications. Data were analysed in terms of frequency, means and standard deviations with use of MS excel, comparative analysis was done using student's t test and odds ratio (OR) with 95% confidence interval (CI) was calculated where applicable. A P – value <0.05 was taken as significant.

We defined preterm as gestations below 37 weeks, low birth weight as less than 2500gm at birth. Chorionicity was determined from USG reports.

3. Results

There were 3145 births during the study period, among them 50 were twin births; which were compared with 50 singleton births. The incidence of twins was 14 per 1000 births or 1.4:100. Six among 50 twins resulted following ovulation induction. 14 of them were monochorionic and 36 were dichorionic twin pregnancies. We observed 3 cases with single fetal demise, both fetus IUD in another twin gestation (total- 5 IUDS) and one fresh stillbirth. There were 94 live births and two early neonatal deaths among twins. Among eight perinatal deaths, five were from monochorionic twins. There was a near miss event among mothers of twin deliveries who survived PPH, she underwent laparotomy and subtotal hysterectomy following caesarean delivery, another mother suffered postpartum eclampsia.

Table 1 Shows mean maternal age for twins and singleton deliveries were 24.7±3.71years and 24.26±3.7years respectively. Mean parity for twin and singleton deliveries

were 2.04± 1.0 and 1.72 ± 0.7, mean gestational age were 35.38± 2.6weeks and 38.63± 1.19 weeks respectively. The mean birth weight for twins was 2.193 ± 0.590 kgs and that for singletons was 2.85±0.46 kg. There was statistical significance (P<0.05) between two groups in three parameters measured. NICU stay was prolonged, surfactant therapy and complex interventional procedures were often needed for management of twin neonates; average stay was 6.142±8.8 days vs 2.12±1.54 days for singleton babies.

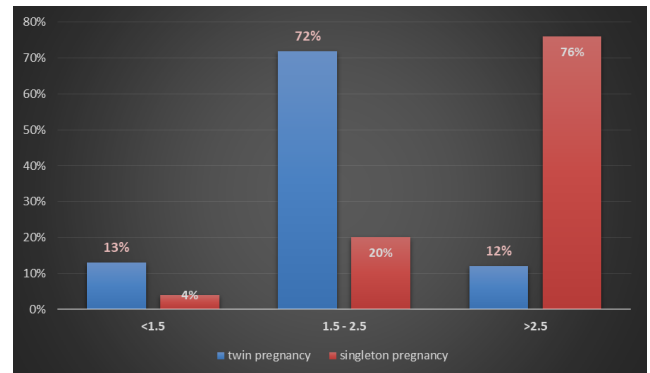


Fig. 1: Birth weight distribution

Table 2 Shows maternal complications and fetal outcome between twin and singleton deliveries. Anemia complicated 4 and half times more often in twin pregnancies than singleton pregnancies (OR:4.57, CI: 0.9194-22.7309), similarly hypertension complicated 2.8 times more often than controls (OR:2.875, CI: 0.8365-9.8809). Risk of malpresentation was 7.9 fold higher for twins than singletons (OR:7.97, CI: 0.9432-67.45). PROM is 2.1 times more often among twin pregnancies than singleton pregnancy. The risk of delivering a twin by caesarean section was 1.9 times more than that for a singleton pregnancy (OR: 1.9, CI: 0.8700-4.4224). The preterm birth rate for twins was 40.2 times higher than that for singleton deliveries (OR: 40.28, CI:10.7577-150.86), similarly LBW was 21 fold frequent among twins than singleton neonates (OR: 21.33,CI:7.6343-59.613). The obtained data were compared with similar studies.

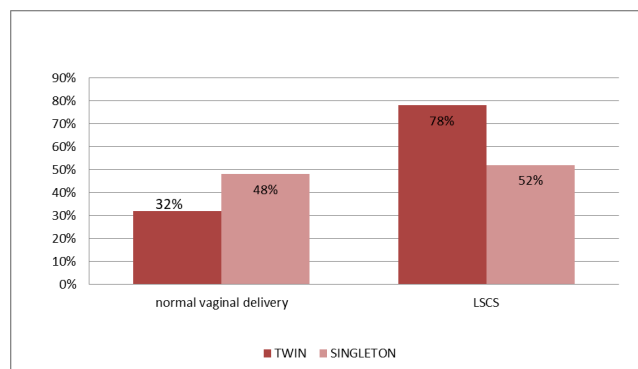
Congenital anomaly was seen to affect 4% of twin newborns and perinatal death rate was 8.5% (5IUFDs+ 1 stillbirth+2 neonatal deaths). There was female sex preponderance (52%) among twins newborns than singletons (44%). PPH was seen in one case following singleton delivery whereas following twin delivery it was seen among 4 cases, among them one case developed DIC, with intraperitoneal bleeding and managed by blood and component transfusion followed by hysterectomy.

Table 1: Maternal and fetal characteristics between twin and singleton groups

S.No	Characteristics	Twin gestation	Singleton gestation	t-test	P-value
1	Maternal age	24.7±3.71	24.26±3.7	0.695	0.2442
2	Mean parity	2.04±1.0	1.72±0.7	1.756	>0.05
3	Gestational age	35.38±2.6	38.63±1.19	7.825	0.0416
4	Birth weight	2.193±0.590	2.85±0.46	-7.342	<0.05
5	NICU stay	6.142±8.8	2.12±1.54	3.173	0
					<0.05

Table 2: Maternal complications and fetal outcome

Variables		Twin No(%)	Singleton No(%)	Odds Ratio	CI 95%
Anemia	Yes	8(16)	2(4)	4.571	0.9194-22.7309
	No	42	48		
HDP	Yes	10(20)	4(8)	2.875	0.8365-9.8809
	No	40	46		
Malpresentation	Yes	7(14)	1(2)	7.97	0.9432-67.45
	No	43	49		
PROM	Yes	6(12)	3(6)	2.13	0.5033-9.0678
	No	44	47		
Mode of delivery	C- section	34(78)	26(52)	1.9615	0.8700-4.4224
	Vaginal	16(32)	24(48)		
PPH	Yes	4(8)	1(4)	4.26	0.4591-39.54
	No	46	49		
Preterm Birth	Yes	36(72)	3(6)	40.28	10.7577-150.86
	No	14	47		
Low Birth weight	Yes	70(74)	5(10)	21.333	7.6343-59.6138
	No	24	45		
Gender	Male	48	28(56)	0.7253	0.3665-1.4351
	Female	52	22(44)		
Perinatal death	Yes	8(8)	0	NA	
	No	94	50		
Congenital anomaly	Yes	4(4)	0	NA	
	No	90	50		

**Fig. 2:** Mode of delivery

4. Discussion

Present study found 6% of twins conceived after ovulation induction (6%), compared to 3.7%, 2.2%, 8% and 14% in studies by Upreti P,⁵ Pandey MR et al,⁶ Masuda S et al.⁷ and Sultana H et al.⁸ respectively.

In the present study the incidence of twin pregnancy was found to be 1.4 in 100 or 14/1000 births or 1.4%. In a study by Upriti P from Uttarakhand, India it was reported as 1 in 52 pregnancies or 1.9%⁵ which is similar to 1.9% reported by Pandey MR et al. in a study from Nepal 5 as against 2.1% reported by Chiwanga ES et al.⁹ In an Nigerian study population it was reported as 1: 29.6 (3.37%)¹⁰ and from a South American city Sao Paulo it was estimated as 3.4% 7 in conformity with race and regional influence on twin incidence.

Mean maternal age in our study was found to be 24.7 years; that reported by Upreti P⁴ as 25.4 years, Pandey Mr et al⁶ as 26 years, and K. Smitha et al¹¹ observed majority cases between 24–28 years, while Obiechina Nj et al¹⁰ al reported mean maternal age as 30 years and Assuncao RA et al¹² reported it as 29.1 years. Our study noticed the mean maternal age for singleton births is at 24.26 years vs 27 years by Obiechina Nj et al.¹⁰ All studies excluding present study reported a P value <0.05 between the two mean maternal ages, confirming twins occurrence at a higher maternal age.

We observed mean parity at 2.04 ± 1.0 , that observed by Obiechina Nj et al¹⁰ was 2.7 ± 2.33 , whereas Assuncao RA et al¹² found it at 1.3 ± 1.5 .

In our study 88% twin pregnancies were from natural conception and 12% resulted from ovulation induction. Whereas 3.7% and 2.2% of twins resulted from OI in studies by Upreti P⁵ and Pandey MR et al.⁶ Assuncao RA et al¹² reported 3.8% of their twins were conceived by assisted reproduction.

Our twins had a mean birth weight of 2.19 kg, that reported by Obiechina Nj et al.¹⁰ as 1.96 kg. Assuncao RA et al¹² reported it as 1.7 kg, 1.8 kg and 2.1 kg respectively for MCMA, MCDA and DCDA twins. The average birth weight of the first twin was 2100 grams and of the second twin was 2040 grams as reported by Pandey Mr et al.⁶ Even IVF/ICSI conceived twin VS singleton weight in a study by Gupta R et al¹³ reported as 2.02 kg vs. 2.71 kg closely similar to our observation.

We have observed that hypertension complicated 20% of twin pregnancies. There was \approx threefold increase in HDP similar to that reported by Obiechina Nj et al¹⁰ (OR: 3.1, 95% CI: 1.8–23.6). Upreti P⁴ reported it at 17.9%, K. Smitha et al¹¹ found approximately 17.3% of twin mothers developed Preeclampsia. Upreti P⁵ reported 30.7% of twin pregnancies were complicated by anemia, our observation was 16%, K. Smitha et al¹¹ reported it as 8.69%.

Malpresentations are common with twin pregnancy. In our study it was seen in 14% cases which is \approx 8 times higher than singleton pregnancies (OR: 7.97, 95% CI: 0.9432–67.45), it was 16% as observed by Obiechina Nj et al,¹⁰ K. Smitha et al¹¹ in their study reported 27 out of 92 i.e 29% twin had malpresentation. PROM complicated twice (12%) more often in twin pregnancies than singleton pregnancies in our study, that observed by Obiechina Nj et al¹⁰ was 4.4 times (OR: 4.4, 95% CI: 1.62–13.90), K. Smitha et al¹¹ reported PPROM as 21.73%. Upreti P⁵ reported it as low as 4.1%.

High prevalence of malpresentation, Hypertension and PROM were responsible for 78% caesarean delivery rate for twins which is \approx 2 times that for singleton pregnancies (OR: 1.96, 95% CI: 0.87–4.42) in our study. Obiechina Nj et al¹⁰ reported 2.9 times higher caesarean rate for twins. Chiwanga ES et al⁹ reported 1.5 times (OR 1.5, 95% CI: 1.4–1.7), K. Smitha et al¹¹ reported it as 64.6%. Upreti

P⁵ reported a CS rate at 49% in her study of 218 twin pregnancies, where they operated on two cases for second twin delivery. We performed CS for delivery of second twin in one case.

We observed 72% of twins delivered preterm, it was 66.2% by Assuncao RA et al,¹² 62.8% by Pandey Mr et al,⁶ 58.3% by Upreti P,⁵ 37.3% (OR: 5.6, 95% CI : 4.2–7.4) by Chiwanga ES et al.⁹ and 36% (OR: 6.47, 95% CI: 2.7–17.05) by Obiechina Nj et al¹⁰ with similar Odds ratio.

In the present study, among 94 twin live births 70 neonates (\approx 74%) were born low birth weight which is 21 times higher than that for singleton births (OR: 21.33, 95% CI: 7.6343–59.6138). Obiechina Nj et al¹⁰ reported this as 56% (OR: 9.33, 95% CI: 4.35–29.95), Upreti P⁵ and K. Smitha et al¹¹ in their study reported LBW rate as 83.8% and 90% respectively.

We observed post-partum haemorrhage in 8% of twin cases ((OR: 4.26, 95% CI: 0.45–39.54) than singleton deliveries, Chiwanga ES et al⁹ reported it at 1.6% among 822 twin deliveries with an (OR: 2.2, 95% CI: 0.8–5.8), in contrast it was 4.1% cases by Upreti P⁵ and similar to ours by Bangal et al¹⁴ and Chowdhury et al¹⁵ at 18.9%.

There were 48 male (48%) babies among 94 live births. Upreti P,⁵ Rezavand N et al,¹⁶ Mutihir et al¹⁷ have reported male sex ratio as 51.6%, 50% and 54.7% respectively among their twin neonates. They concluded it was not significantly different from singleton pregnancies. However, Assuncao RA et al,¹² Melamed et al¹⁸ (49.1%) and Chittacharoen A et al¹⁹ found boy babies less often than girls among their twins which is similar to our observation. J. Whitridge Williams⁴ stated there is a gradual fall in male sex percentage as the number of fetuses increase in any pregnancy.

Congenital anomalies were observed among 4% of twins in our study, Pandey MR et al⁶ reported as 8.4% among their twin NICU admissions, Assuncao RA et al¹² reported it as 12.8%.

5. Conclusion

Twin pregnancies continued to be high risk for both mother and baby, in matching proportion over past two decades of studies cited in this article. We understand that there could be an improvement in perinatal outcome by minimising the gap between need and supply of infrastructure in any NICU. Maternal outcome continued to be same due to rising number of mothers postponing pregnancy and experiencing fertility assistance.

6. Source of Funding

None.

7. Conflict of Interest

The authors declare no conflict of interest.

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