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Research Article

Incidence and Perinatal Outcomes of Twin Pregnancy in Tertiary Healthcare Facility, Odisha, India

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Abstract

Background: Assisted reproductive technology has resulted in a progressive rise in the incidence of twin pregnancies, which affect both mother and child in terms of antepartum complications. ***Objective***: To assess the perinatal outcomes of twin pregnancies and the influence of chorionicity on them in a tertiary healthcare facility. ***Methods***: It is a hospital-based cross-sectional study that was carried out in the Obstetrics and Gynecology Department of S.C.B. Medical College Hospital, Cuttack, during the period from 2013 to 2015. All mothers having twin pregnancies (with 28 weeks of completed gestation) admitted to the antenatal (ANC) ward and labor room during this period were taken as a study group, and written informed consent was taken after explaining the details of the study. ***Results***: A total of 150 cases are identified; among them, 98 cases (65.33%) are dichorionic diamniotic, 50 cases (33.33%) are monochorionic diamniotic, and 2 cases (1.33%) are monochorionic and monoamniotic pregnancies. The majority (66%) of the twin pregnancies were between 35-38 wks of gestational age at the onset of labor. It is also observed that macerated births, stillbirths, and neonatal deaths are higher in mono-chorionic twins as compared to dichorionic twins. ***Conclusions***: Twin pregnancies carry a greater risk of adverse outcomes, especially perinatal mortality and neonatal morbidity, in monochorionic twins than dichorionic twins. Good antenatal care, early diagnosis of chorionicity, and antepartum assessment of placentation will prevent mortality and morbidity.

Keywords: Fetus, Pregnancy, Perinatal outcome, Twin pregnancy.

حدوث الحمل التوأم ونتائجه في الفترة المحيطة بالولادة في مرفق الرعاية الصحية الثالثية، أوديشا، الهند

الخلاصة

الخلفية: أدت التكنولوجيا الإنجابية المساعدة إلى ارتفاع تدريجي في حالات الحمل بتوائم ، والتي تؤثر على كل من الأم والطفل من حيث مضاعفات ما قبل الولادة. **الهدف**: تقييم نتائج الحمل بتوائم في الفترة المحيطة بالولادة وتأثير المشيمية عليها في مرفق الرعاية الصحية الثالثية. **الطريقة**: دراسة مقطعية قائمة على المستشفى تم إجراؤها في قسم أمراض النساء والتوليد في مستشفى كلية الطب SCB، كوتاك، خلال الفترة من 2013 إلى 2015. تم قبول جميع الأمهات اللائي لديهن حمل توأم (مع 28 أسبوعا من الحمل المكتمل) في جناح ما قبل الولادة وغرفة المخاض خلال هذه الفترة كمجموعة دراسة، وتم أخذ موافقة خطية مستنيرة بعد شرح تفاصيل الدراسة. **النتائج**: تم تحديد ما مجموعه 150 حالة. من بينها 98 حالة هي diamniotic dichorionic، 50 حالة (33.33٪) هي diamniotic monochorionic، وحالتين أحادي المشيمة وأحادي السلى. كانت الغالبية من حالات الحمل بتوأم بين 35-38 أسبوعا من عمر الحمل في بداية المخاض. ويلاحظ أيضا أن الولادات المتبوعة والإملاص ووفيات الأطفال حديثي الولادة أعلى في التوائم أحادية المشيمة مقارنة بالتوائم ثنائية المشيمة. **الاستنتاجات**: حمل التوائم ينطوي على مخاطر أكبر من النتائج السلبية، وخاصة الوفيات في الفترة المحيطة بالولادة والمراضة الوليدية، في التوائم أحادية المشيمة من التوائم ثنائية المشيمة. الرعاية الجيدة قبل الولادة، والتشخيص المبكر للمشيمة وتقييمها قبل الولادة ستمنع الوفيات والمراضة.

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INTRODUCTION

The growth of two fetuses in the womb at the same time is commonly termed a twin pregnancy. Extensive practice of assisted reproductive technology resulted in a progressive rise in the incidence of twin pregnancies [1]. The danger to both mother and child is more prevalent in multiple pregnancies. Antepartum complications are found very commonly in multiple pregnancies (>80% cases) in comparison with singleton gestation (developing in nearly 25% of cases). Preterm labor, premature rupture of the membranes, intrauterine growth restriction, intrauterine fetal demise, gestational diabetes, and pre-eclampsia are the most common complications identified during the antenatal period [2]. There is a substantial variation in the rate of multiple pregnancies among countries and regions. The natural twinning rate has a wide range of geographic variation, starting from 8 twins per 1000 births in East Asia and Oceania to more than 17 twins per 1000 births in many countries on the African continent. In India, natural twinning rates of less than 9 twin births per 1000 births are reported by Smith et al. [3]. Nearly 94% of multiple pregnancies are found to be twin pregnancies [4]. The risk of preterm labor is the most commonly reported perinatal outcome of multiple gestations. As per the data published by US national statistics, out of the total 137,217 twin pregnancies, the majority of newborns delivered preterm (58.8%), and simultaneously, a sizable number of babies delivered very preterm (11.4%) [5]. The higher perinatal mortality in multiple pregnancies resulted mostly from the consequences of the higher incidence of preterm delivery and its related complications [6]. Pre-term babies are frequently susceptible to common fatal conditions like IVH (intraventricular hemorrhage), necrotizing enterocolitis, PVL (periventricular leukomalacia), and retinopathy of prematurity and all these conditions may result in long-term morbidity [7]. Multiple pregnancies also have a higher risk of various congenital anomalies like trisomies, neural tube defect and gastrointestinal tract structural anomalies [8]. There was well-established evidence that multiple pregnancies have always had a higher risk of cerebral palsy than singletons [9].

METHODS

The present study is a hospital-based cross-sectional study that was carried out in the Obstetrics and Gynecology Department of S.C.B. Medical College and Hospital at Cuttack, India, during the period from 2013 to 2015. All mothers having twin pregnancies (with 28 weeks of completed gestation) admitted to the antenatal (ANC) ward and labor room during this period were taken as our study group, and written informed consent was taken after explaining the details of the study.

Inclusion Criteria

All women with twin pregnancies beyond 28 weeks of gestation.

Exclusion Criteria

Multifetal pregnancies having more than two fetuses.

Outcome measurements

A detailed history was taken regarding the age and parity of the mother, a proper menstrual history, duration of married life, history of infertility treatment, excessive vomiting in the early months and swelling of feet, and vaginal bleeding. A thorough clinical examination was done, including weight, blood pressure, pallor, and systemic examination. The height of the uterus was measured and compared with the period of amenorrhea, and the contour of the abdomen was noted. The abdominal and per-vaginal examinations were done carefully and recorded. Routine investigations, viz. hemoglobin, differential count, total leukocyte count, urine routine and microscopy, blood grouping and Rh typing, fasting blood sugar, HIV, HBS Ag, HCV Ag, etc., were done in all cases, along with ultrasonography. Special investigations like PIH profiles, Doppler ultrasounds, etc. were done whenever necessary. Chorionicity detected by ultrasonography was taken into consideration. Cases of IUGR and discordancy detected prenatally by ultrasound were recorded. Antenatal corticosteroids were given to cases presenting with preterm labor before 34 weeks and to complicated cases needing early termination. In some cases, induction was required for various obstetrical indications. The perinatal outcome of the babies was analyzed based on their gestational age, birth weight, SNCU admission, number of macerated births, stillbirths, neonatal births, etc. Perinatal mortality was calculated based on the formula:

Perinatal mortality rate= {No. of perinatal deaths/total No. of births (still births + live births)} x 1000

RESULTS

A compilation of 150 cases is obtained; of these, 98 (65.33%) are dichorionic diamniotic, 50 (33.33%) are monochorionic diamniotic, and 2 (1.33%) are monochorionic and monoamniotic pregnancies. At the onset of labor, the majority of twin pregnancies (66%) occurred between 35 and 38 weeks of gestational age; specifically, 38% occurred between 37 and 38 weeks, and 28% occurred between 35 and 36 weeks. The average gestational age of dichorionic twins was 36.13±2.31 weeks. The mean gestational age of

monochorionic twins was 35.46±2.49 weeks, as indicated in Table 1.

Table 1: Distribution of cases according to gestational age

Duration of gestation (wk)	No. of cases	Gestational age	DC Cases	Gestational age of DC cases	MC Cases	Gestational age of MC cases
28–30	6(4)		3(3.06)		3(5.76)	
31–32	10(6.66)		6(6.12)		4(7.69)	
33–34	20(13.33)		10(10.2)		10(19.23)	
35–36	42(28)	35.9±2.49 wks	27(27.55)	36.13±2.31 wks	15(28.84)	35.46±2.49
37-38	57(38)		40(40.81)		17(32.69)	
39-40	15(10)		12(12.24)		3(5.76)	
Total	150(100)		98(65.33)		52(34.67)	

Values were expressed as mean±SD, number, and percentage. DC: dichorionic; MC: monochorionic.

Additionally, the incidence of preterm delivery was found to be 61.52% during monochorionic gestations and 46.8% during dichorionic gestations. According to the data presented in Table 2, the first twin had a mean birth weight of 2.0±0.47 kg, while the second twin had 1.84±0.409 kg. Statistically, the bodyweight difference between the first and second infants was not insignificant (p>0.05).

Table 2: Distribution of cases according to birth weight

Bwt (kg)	No. of Cases	DC Cases	MC Cases	1st Twin	Weight of 1st twin	2nd Twin	Weight of 2nd twin	Chi Square
<0.90	10(3.33)	6	4	4		6		
1–1.49	41(13.66)	23	18	19		22		
1.5–1.9	92(30.66)	58	34	41	2.0±0.47 kg	51	1.84±0.409 kg	X^2=17.005
2-2.49	120(40)	81	39	56		64		p-value<0.05
2.5–2.9	34(11.33)	26	8	27		7		
>3.0	3(1.0)	2	1	3		0		
Total	300(100)	196	104	150		150		

Values were expressed as mean±SD, number, and percentage. DC: dichorionic; MC: monochorionic.

In relation to the fetal presentation as indicated in Table 3, vertex-breech presentation (18%) was the least frequent, occurring at 66.66%. The prevalence of malpresentation was observed to be higher in monochorionic pregnancies, with 19 (36.5%) fetuses malpresented out of 52 monochorionic pregnancies compared to 31 (31.6%) fetuses malpresented out of 98 dichorionic pregnancies.

Table 3: Distribution according to the presentation of fetuses

Presentation		Total Cases	DC Cases	MC Cases	Chi Square
Normal presentation	Vertex-Vertex	100(66.66)	65	35	
Mal presentation	Vertex-Breech	27(18)	18	9	
	Breech-Vertex	12(8.0)	9	3	
	Breech-Breech	6(4.0)	3	3	X2=0.015
	Breech-Transverse	3(2.0)	1	2	p-value>0.05
	Vertex-Transverse	1(0.66)	1	-	
	Transverse-Breech	1(0.66)	1	-	
	Total	150(100)	98	52	

Values were expressed as number and percentage. DC: dichorionic; MC: monochorionic.

The p-value of 0.9 indicates that the difference was not statistically significant. In twin pregnancies, a multitude of delivery methods are possible. The majority of twins were delivered vaginally (77.3% for the first twin and 76.6% for the second twin), as shown in Table 4. Caesarean section was utilized for the remaining 23%. Similarly, vaginal deliveries were performed on 60% of second twins and 70% of first twins with vertex presentation; breech deliveries were performed more frequently on second twins (14%), compared to 1st twins (5%). 2% of the cases involved the use of forceps. A vacuum was utilized to deliver a solitary infant. The study findings indicate that malpresentation was the leading cause of caesarean sections (46%), followed by acute PIH (23%), previous caesarean cases (17%), APH (6%), and fetal distress (6%) (Figure 1).

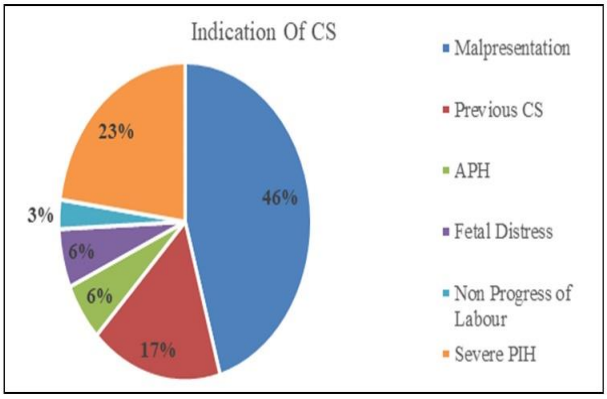

Figure 1: Distribution of caesarean section according to indication

Table 4: Distribution of cases according to the mode of delivery

Mode of Delivery		First twin	Second twin
Vaginal delivery	Normal Vaginal delivery (Vaginal delivery with vertex presentation)	105(70)	90(60)
	Assisted Breech Delivery	8(5.33)	21(14)
	Forceps Delivery	3(2.0)	3(2.0)
	Ventouse	-	1(0.66)
L.S.C.S		34(22.6)	35(23.3)
Total		150(100)	150(150)

Values were expressed as number and percentage.

Cesarean section was utilized as a result of labor failure in a solitary instance (2.8%). The analysis of the data in Table 5 indicates that perinatal mortality affected 61 cases out of 300 (31 out of 196 dichorionic infants and 30 out of 104 monochorionic babies).

Table 5: Perinatal death in respect to chorionicity

	Monochorionic	Dichorionic
No. of Babies	104	196
Macerated Birth	7	4
Still birth	3	1
Neonatal Death	20	26
Total Perinatal Death	30	31
PMR/1000 live births	260/1000	136.84/1000

Excluded those having Bwt<1000 g; $p<0.0001$

Additionally, it has been noted that monochorionic twins exhibit a higher incidence of macerated births, stillbirths, and neonatal fatalities in comparison to dichorionic twins. In dichorionic pregnancy, the perinatal mortality rate was 136.84/1000 (13.6%), whereas in monochorionic pregnancy, it was 260/1000 (26%). A significant association ($p<0.0001$) was identified between chorionicity and perinatal mortality. PMR has been computed in relation to one thousand pregnancies. Those with a Bwt of less than 1000 g were excluded.

DISCUSSION

The present study was conducted on 150 cases of twin pregnancies (28 weeks of completed gestation) and the duration of gestation was determined by menstrual history, clinical examination and sonography. In the present study, the average duration of gestation was 35.9±2.39 wks. The study conducted by Upreti (2018) indicated that the average gestational age at delivery was 35.2 weeks, which is very comparable to the present study finding [10]. However, another study done by Cheung *et al*. indicated the ideal gestational age for twins was within a range of 37–39 weeks, and the finding was different from that of the current study [11]. All studies on the perinatal outcome of twin pregnancies agreed that preterm birth is the greatest single threat for neonates. The incidence of preterm delivery in the present study was 52%, and this study finding was in concordance with a study finding by Arias *et al*. that fifty-seven percent of twin pregnancies are delivered before 37 weeks of gestation [12]. Similarly, additional studies conducted by Patel *et al*. (1984) in Glasgow and Pandole *et al*. (2003) [13] reported that the incidence of preterm delivery in twin gestation was 44% and 61.2%, respectively, and our current study result was within this range. In this study, the average gestational age in dichorionic twins was 36±2.31 wks and in monochorionic twins was 35.45±2.51 wks. The incidence of preterm delivery in dichorionic and monochorionic gestations was 46.8% and 61.52%, respectively. The findings of our study were comparable to those of Hack et al.'s (2008) study, which discovered that the median gestational age was one week higher in DC twins than in MC twins [14]. In our study, the majority (40%) had birth weights between 2 and 2.49 kg. The mean birth weight of the first twin was 2.0±0.47 kg, and that of the second twin was 1.84±0.409 kg. The difference in birth weight between the first and second twins was statistically significant ($p<0.05$). Pandole *et al*. also reported the average weight of the first twin as 2.0 kg and 1.7 kg for the second twin [13]. The increased incidence of IUGR and prematurity in twins may help to explain why this was comparable to our study. As per our study, 87.6% of babies had a birth weight <2.5 kg, which differed from the study done by Blondel *et al*. (2002), in which 55.8% of twins had birth weights below 2500 g [15]. According to our study, 85.7% and 91.33% of babies had birth weights less than 2.5 kg in dichorionic and monochorionic gestations, respectively. In the current study, both twins presented by vertex in 66.66% of cases. The commonest presentation was vertex-vertex (66.66%), followed by vertex-breech (18%). This was in concordance with the study done by Pandole *et al.*, in which the frequency of presentation was vertex-vertex in 57.55%, vertex-breech in 34 cases (18.08%), and breech-vertex in 10.6% [13]. Divon and colleagues reported vertex-vertex in 42% and vertex-breech in 27% of cases [16], and the aforesaid study findings were dissimilar to our study findings. As per our study, in dichorionic gestations, vertex-vertex presentation was found in 68.3% of cases, and in monochorionic gestations, it was found in 63.4% of cases. The rare presentations were vertex-transverse (one case) and transverse-breech (one case), and both of these rare cases were found in dichorionic type.

Conclusion

Monochorionic twin pregnancies are associated with a higher incidence of adverse outcomes, particularly perinatal mortality and neonatal morbidity compared to dichorionic twin pregnancies. Obstetricians are confronted with a multitude of challenges throughout the entire process of twin pregnancies, including complications that may arise postpartum. Preventing

mortality and morbidity requires antepartum assessment of placentation, early detection of chorionicity, and effective antenatal care. Enhancing intensive care and implementing rigorous intrapartum monitoring, particularly for premature infants, will contribute to achieving a more favorable outcome.

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Conflict of interests

No conflict of interest was declared by the authors.

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Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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