

Clinical Profile and Outcome of Twin Babies Delivered at A Tertiary Care Center in Eastern Nepal

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ABSTRACT

Background

Twin pregnancies are often associated with higher risks of complications for both the mother and the neonates, particularly in resource-limited settings. This study was conducted at a tertiary care center in Eastern Nepal to assess the clinical profile and outcomes of twin pregnancies.

Methods

A hospital-based prospective observational study was carried out in the department of Pediatric and neonatology at Nobel Medical College Teaching Hospital, Biratnagar, Nepal over the period of 6 month. Total of 32 twin pregnancies of gestational age of ≥ 28 weeks, where both twins were alive at delivery were included. Data were collected on maternal and neonatal characteristics, including birth weight, gestational age, Apgar scores, and clinical outcomes. Statistical analyses were performed to compare the outcomes between the first and second twins.

Results

In the present, study total of 32 eligible twin were analyzed. The majority of twins were (53.1%) delivered between 32 to <37 weeks of gestation rest 46.87% delivering between 28 to <32 weeks. The average Apgar scores were 6.5 at 1 minute and 8.6 at 5 minutes. The most common clinical feature seen in twin neonates was lethargy which was seen in 32 neonates (50%). NICU admission was required for 70.3% of the neonates. There were no significant differences between groups twin 1 and twin 2 in most health indicators, such as clinical symptoms, hemoglobin, PCV, serum calcium level, jaundice, TTTS, chest X-ray findings, NICU admissions, or overall outcomes ($P > 0.05$). However, twin 1 had a higher rate of neonatal sepsis ($P = 0.048$). notable difference was observed in the incidence of neonatal sepsis between the first and second twins, with the first twin being more affected. Neonatal mortality rate in twin in the present study was 7.8%.

Conclusions

Twin pregnancies have high incidence of preterm delivery and low birth weight. Requirement of NICU care is more in case of first twin.

Keywords: twins; pregnancy; delivery; apgar score; patient outcome assessment.

INTRODUCTION

Twin pregnancies are at higher risks compared to single births, including preterm delivery, low birth weight, and prolonged NICU stays. Understanding how twins are delivered and cared for afterward is essential for improving outcomes. Women carrying twins, face

increased risks of neonatal morbidity, mortality, and challenges in growth and neurodevelopment compared to singletons. Since the 1980s, the global twinning rate has increased by a third, from 9.1 to 12.0 per 1,000 deliveries, with around 1.6 million twin pairs born annually.¹ This rise is due to factors like maternal age

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and the use of assisted reproductive technologies.² Twin delivery rates with IVF vary globally, from 5.8% in Sweden to 35.8% in Greece and Bulgaria.³ In India, twin gestations contribute to 10% of perinatal mortality.^{4,5} Factors like genetics, environmental influences, maternal age, and increased parity are linked to twin gestations.^{6,7} This study explores neonatal outcomes in twin pregnancies in Eastern Nepal.

METHODS

This hospital-based prospective observational study was conducted at Nobel Medical College Teaching Hospital, a tertiary care center in Biratnagar, Eastern Nepal, within the Department of Pediatrics and Neonatology. The study was conducted over a six-month period from December 2023 to May 2024, following approval from the Institutional Review Board (IRB) with the IRC number 904/2023. Informed consent was obtained from the parents of each patient included in the study. The study population comprised all twin pregnancies delivered at Nobel Medical College Teaching Hospital during the specified period. Inclusion criteria were twin pregnancies with a gestational age of at least 28 weeks, both twins alive at the time of delivery, and the availability of complete medical records. Pregnancies complicated by lethal fetal anomalies were excluded from the study. A total of 32 twin pregnancies that met the inclusion criteria were enrolled. Data collection involved recording maternal and neonatal characteristics from patients admitted to the ward. Maternal data included age, parity, history of assisted reproductive techniques (such as IVF), mode of delivery (either lower segment cesarean section [LSCS] or spontaneous vaginal delivery [SVD]), and maternal comorbidities. Neonatal data included gender, gestational age at birth, birth weight, Apgar scores, clinical characteristics (such as lethargy, hypoglycemia, sepsis, and respiratory problems), NICU admission status, and discharge outcomes. A comparison between Twin 1 and Twin 2 in terms of NICU admission rates and discharge status was also analyzed. Statistical analysis was performed using SPSS version 16. Descriptive statistics summarized maternal and neonatal characteristics, with frequencies

and percentages calculated for categorical variables, while continuous variables were presented as mean \pm standard deviation (SD) or median with interquartile range, depending on distribution. Comparisons between the first and second twins were conducted using chi-square tests for categorical variables and t-tests for continuous variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

In the present, study total of 32 eligible twin were analyzed. The majority of mothers (53.1%) delivered between 32 to <37 weeks of gestation rest 46.87% delivering between 28 to <32 weeks, The cohort comprised primarily primigravida mothers (56.3%), while multiparous mothers accounted for 43.8%. Assisted pregnancy (Invitro fertilization-IVF) was found in only 21.9%. the detail of Maternal characteristics is as shown in (Table 1).

Characteristics	Frequency (%)
Gestational age group	
28 - <32 weeks	15 (46.9)
32 - <37 weeks	17 (53.1)
Gravida	
Primigravida	18(56.3)
Multiparous	14(43.8)
Use of IVF	
No IVF	25(78.1)
IVF	7(21.9)
Maternal Comorbidities	
Diabetes Mellitus	4(12.5)
Hypertension	5(15.6)
Hypothyroidism	2(6.3)
Mode of Delivery	
LSCS	13(40.6)
SVD	19(59.4)

In the present study, total of 64 neonates were analyzed from 32 twin. Of them 73.4% (n=47) constitutes male and 26.6%(n=17) constitutes female neonates with male to female neonate ratio of 2.76:1. Majority (60.9%) of newborns had a birth weight of 1500-2500 grams. Around 23.4% weighed less than 1500 grams, and 15.6% weighed between 2500-4000 grams. In terms of weight for gestational age, 84.4% (n=54) were considered appropriate for their gestational age,

while 15.6% (n=10) were classified as small for their gestational age. Detail of the neonatal Characteristics is as shown in (Table 2).

Characteristics	Frequency (%)
Gender	
Male	47(73.4)
Female	17(26.6)
Birth weight	
Weight < 1500 gm	15(23.4)
1500 - <2500 gm	39(60.9)
2500 - <4000 gm	10(15.6)
Weight for gestational age	
Small for gestational age	54(84.4)
Appropriate for gestational age	10(15.6)
Large for gestational age	0
Types of twins	
Monochorionic monoamniotic	20(62.55)
Dichorionic diamniotic	10(31.3)
Monochorionic diamniotic	2(6.3)

The most common symptoms were lethargy (50%), refuse to feed (14.1%), and breathing problems (12.5%). The average Apgar scores were 6.5 at 1 minute and 8.6 at 5 minutes. The most common clinical feature seen in twin neonates was lethary which was seen in 3 neonates (50%). Other clinical symptoms seen were as tabulated below in (Table 3).

Characteristics	Frequency (%)
Asymptomatic	15(23.4)
Lethargy	32(50.0)
Icterus	11(17.2)
Refuse to feed	9(14.1)
Distress	8(12.5)

Upon comparing Twin 1 and Twin 2, no substantial differences were noted. They had the same gender, weight categories, Apgar scores, hemoglobin levels, and overall health outcomes. Furthermore, both twins had comparable rates of admission and discharge from the NICU, with most releases occurring in stable condition. There were no significant differences between groups twin 1 and twin 2 in most health indicators, such as symptoms, hemoglobin, PCV, calcium, jaundice, TTTS, chest X-ray findings, NICU admissions, or overall outcomes (P > 0.05). However, twin 1 had a higher rate of neonatal sepsis (P = 0.048).

Characteristics	Twins		p-value
	T1 n(%)	T2 n(%)	
Symptoms			
No	24(75.00)	25(78.10)	0.768
Yes	8(25.00)	7(21.90)	
Hemoglobin			
Mean± SD	16.8 ± 2.6	16.2 ± 1.8	0.218
PCV			
mean± SD	50.6 ± 7.6	48.4 ± 5	0.17
Serum calcium			
less than 7 mg/dl	6(18.80)	4(12.50)	0.491
7mg/dl and more	26(81.30)	28(87.50)	
Jaundice			
No	25(78.10)	28(87.50)	0.32
Yes	7(21.90)	4(12.50)	
Hypoglycemia			
No	19(59.40)	26(81.30)	0.055
Yes	13(40.60)	6(18.80)	
Respiratory distress syndrome			
No	19(59.40)	26(81.30)	0.055
Yes	13(40.60)	6(18.80)	
Neonatal sepsis			
No	20(62.50)	27(84.40)	0.048
Yes	12(37.50)	5(15.60)	
Apnea of Prematurity P			
No	21(65.60)	27(84.40)	0.083
Yes	11(34.40)	5(15.60)	
Twin to twin transfusion syndrome			
No	21(65.60)	26(81.30)	0.157
Yes	11(34.40)	6(18.80)	
Chest X-ray			
Normal	22(68.80)	20(62.50)	0.806*
Respiratory distress syndrome	7(21.90)	6(18.80)	
Transient Tachypnoea of Newborn	3(9.40)	5(15.60)	
Pneumonia	0	1(3.10)	
NICU admission			
No	12(37.50)	7(21.90)	0.171
Yes	20(62.50)	25(78.10)	
Outcome			
Discharged	28(87.50)	28(87.50)	1.000*
Expired	3(9.40)	2(6.30)	
Left against Medical Advice	1(3.10)	2(6.30)	
Duration of hospital stay (days)			
Mean± SD	4.7 ± 2.4	3.7 ± 1.5	0.051

There were also trends towards significance ($P \approx 0.05$) in hypoglycemia, RDS, AOP, and length of hospital stay, with twin 1 generally having more adverse outcomes. Parameters comparing twin 1 and twin 2 is as shown below in (Table 4).

Around, 70% of the neonates required NICU admission, with the duration of hospital stay averaging 4.2 ± 2 days. The discharge outcomes indicated that 87.5% of neonates were discharged in stable condition, 7.8% expired, and 4.7% were left against medical advice.

DISCUSSION

The Twin pregnancy is considered a one of high-risk pregnancy owing to unique antepartum, intrapartum, and fetal complications. Our study observed an incidence of 22.3 per 1000 live births, which is higher due to the nature of the tertiary referral center. Over the years, the rate and number of twin births have increased, largely driven by advancements in infertility treatments. Preterm labor was common in this study, with many cases linked to PROM, and most patients were admitted in the active phase of labor. The incidence of LSCS in this study aligns with findings from the group of University of Toronto.⁸ In the present study, 21.9% ($n=7$) of the mothers had in vitro fertilization. In the study by Sunderam et al, it has been estimated that assisted conception accounts for about 40% of twin births (19% from in vitro fertilization (IVF) and 21% from non-IVF assisted conception) and 77% of triplet and higher-order births (25% from IVF and 52% from non-IVF assisted conception).⁹ Fetal risks, particularly regarding morbidity and mortality, are primarily linked to preterm birth and low birth weight in twins compared to singletons.¹⁰ There is not much difference in gender ration of twin neonates in the literature. The study by Nieczuja et al has found that the sex ratio of 1:1 for twins and a sex ratio of 1:1.18 for singleton deliveries.¹¹ In the present study there was more male twin than female with male to female ratio of 2.7:1. The incidence of preterm birth is higher in twin pregnancies than in singleton pregnancies: approximately 50% of twins are born before 37 weeks of gestation, accounting for 18%–25% of all preterm

births.¹² In the present study there were 84.4% ($n=54$) neonates appropriate for gestational age with mean birth weight being $1871.9 + 495.8$ gram. Also in the study by Kato et al. the mean birth weight of twin pregnancies was lower: 2,590 g for the first twin and 2,560 g for the second twin.¹³ Additionally, the rate of low birth weight in this study was higher than reported in other studies.^{14,15} The mean Apgar score in the present study was 6.5 and 8.6 ± 1 at 1 and 5 minute respectively. In the study by Rezavan and group the agar score at 1 and 5 min for Twin one and twin 2 was 7 and 7 at 1 minute and 9 and 9 respectively.¹⁶ Most common NICU admission diagnosis made were respiratory distress syndrome (29.7% ($n=19$)) followed by neonatal sepsis 26.6% ($n=17$). Twin 1 had significantly higher rate respiratory distress syndrome and neonatal sepsis which was 40.6% ($n=13$) and 27.5% ($n=12$) respectively. In the study by Meshram et al it has been shown that Jaundice (37.62%) and respiratory distress syndrome (36.67%) were the most common diagnosis in twin neonates while sepsis (34.71%) was predominant in singleton. Sepsis (33.9%) was the most common cause of death in singleton neonates while respiratory distress syndrome (35.38%) in twin births.¹⁷ In the present study a total of 70.3% ($n=45$) were admitted in NICU. Regarding NICU admission Twin 2 had higher rate of admission which was 78.1% ($n=25$). In the study done by Nandakishore et al.¹⁸ 46% of neonates were shifted to NICU due to low birth weight, respiratory distress, jaundice, and sepsis. In a study of Pant et al. NICU admissions were required in 19.6% of the neonates due to LBW and prematurity.¹⁹ In our study, the mean duration of hospital stay was 4.2 ± 2 days, which is slightly longer than the 3 to 5 days reported in other studies.^{20,21} This discrepancy may be due to differences in the severity of cases or the NICU care protocols in our setting. Enhanced intranatal obstetric care, including the liberal use of LSCS, alongside robust neonatal intensive care units (especially for premature, low birth weight babies), can significantly reduce perinatal mortality rates in twin pregnancies.⁸ In this study, mortality rate of twin neonates was 7.8%. Which is similar to study result by Chitrit et al. The first

twin exhibited higher perinatal mortality in the present study. In the study by Chitrit et al. on analyzing 3 years perinatal mortality in twin pregnancies in Seine Saint-Denis (France) they found that the perinatal mortality rate in twin pregnancy was 78.0 per 1000 twin babies delivered. Out of 86 twin deaths, 38 (44.2%) were born before 28 weeks gestation and out of 82 twin perinatal deaths, 37 (45.1%) weighed less than 1000 gram.

CONCLUSIONS

This study emphasizes the high rates of preterm birth, low birth weight, and neonatal complications, particularly sepsis in the first twin, in twin pregnancies

at our center in Eastern Nepal. These findings highlight the necessity for enhanced neonatal care and monitoring in twin pregnancies, particularly in resource-constrained settings.

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REFERENCES

- Monden C., Pison G., Smits J. Twin Peaks: more twinning in humans than ever before. *Hum Reprod.* 2021;36(11):2950-2957. [[Google Scholar](#)][[DOI](#)]
- Cruikshank D. C. Intrapartum management of twin gestations. *Obstet Gynecol.* 2007;109(4):1074-1085. [[Google Scholar](#)][[DOI](#)]
- Luke B., Gopal D., Cabral H., Stern J. E., Diop H. Adverse pregnancy, birth, and infant outcomes in twins: effects of maternal fertility status and infant gender combinations; the Massachusetts Outcomes Study of Assisted Reproductive Technology. *Am J Obstet Gynecol.* 2017;217(3):330.e1-330.e15. [[Google Scholar](#)][[DOI](#)]
- Conde-Agudelo A., Belizán J. M., Lindmark G. Maternal morbidity and mortality associated with multiple gestations. *Obstet Gynecol.* 2000;95(5 Pt 1):688-695. [[Google Scholar](#)][[Link](#)]
- Blondel B., Kermarrec M., S. Trends in the occurrence, determinants, and consequences of multiple births. *Eur J Obstet Gynecol Reprod Biol.* 2002;102(1):1-5. [[Google Scholar](#)][[DOI](#)]
- Nylander P. P. S. The factors that influence twinning rates. *Acta Genet Medicae et Gemellologiae: Twin Research.* 1981;30(2):131-139. [[Google Scholar](#)][[DOI](#)]
- Bortolus R., Parazzini F., Chatenoud L., Benzi G., Bianchi M. M., Marconi A. The epidemiology of multiple births. *Hum Reprod Update.* 1999;5(3):179-187. [[Google Scholar](#)][[DOI](#)]
- Shaw S., Behera B. K., Nayak B. C., Mohapatra G. Incidence and perinatal outcomes of twin pregnancy in a tertiary healthcare facility, Odisha, India. *Al-Rafidain J Med Sci.* 2023;5(1. [[Google Scholar](#)][[DOI](#)]
- Sunderam S., Kissin D. M., Zhang Y., et al. Assisted reproductive technology surveillance - United States, 2013. *MMWR Surveill Summ.* 2015;64(8):1-25. [[Google Scholar](#)][[DOI](#)]
- Colditz P. Multiple Pregnancy: Epidemiology, Gestation, and Perinatal Outcome Editors: Isaac Blickstein and Louis G. Keith. *Twin Res Hum Genet.* 2006;9(1):183-184. [[Google Scholar](#)][[DOI](#)]
- Nieczuja-Dwojcka J., Marchewka-Długońska J., Budnik A., Wojtowicz P., Gienza B. Factors influencing sex ratio at birth in Krosno, Poland. *Sci Rep.* 2024;14:123. [[Google Scholar](#)][[DOI](#)]
- Tingleff, T. et al. Different pathways for preterm birth between singleton and twin pregnancies: a population-based registry study of 481 176 nulliparous women. *BJOG An Int. J. Obstet. Gynaecol.* 130, 387–395 (2023). [[Google Scholar](#)][[DOI](#)]
- Kato N. Reference birthweight range for multiple birth neonates in Japan. *BMC Pregnancy Childbirth.* 2004;4:2. [[Google Scholar](#)][[DOI](#)]
- Kalish R. B., Branum A., Sharma G., Keith

- L. G., Blickstein I. Gestational age-specific distribution of twin birth weight discordance. *J Perinat Med.* 2005;33(2):117-120. [[Google Scholar](#)][[DOI](#)]
15. Grigoriadis S., Brown C., Gorenstein C., et al. Perinatal suicide in Ontario, Canada: a year population-based study. *CMAJ.* 2017;189(34). [[Google Scholar](#)][[DOI](#)]
16. Rezavand N., Veisi F., Malek-Khosravi S., Zangeneh M., Kohzadi M. Assessment of frequency of twin pregnancy and neonatal outcome in deliveries of Mo'tazedi Hospital, Kermanshah in 2004-2007. *J Obstet Gynecol India.* 2014;64(1):19-22. [[Google Scholar](#)][[DOI](#)]
17. Meshram R., James A. Neonatal outcome of twins and singleton neonates: An experience from tertiary care teaching center of Eastern Maharashtra, India. *J Clin Neonatol.* 2022;11(3):159-164. [[Google Scholar](#)][[DOI](#)]
18. More N., Tondge G., Dasila P. S., Ujede A. M. Maternal and neonatal outcomes in twin pregnancy: a prospective study. *Int J Reprod Contracept Obstet Gynecol.* 2023;12(5):1303-1308. [[Google Scholar](#)][[DOI](#)]
19. Pant P., Patil Y., Patil S. K. A retrospective study of maternal and fetal outcomes of twin pregnancy. *Biomed Pharmacol J.* 2022;15(1):123-130. [[Google Scholar](#)][[DOI](#)]
20. Sansregret A., Bujold E., Gauthier R. J. Twin delivery after a previous caesarean: A twelve-year experience. *J Obstet Gynaecol Can.* 2003;25(4):294-298. [[Google Scholar](#)][[DOI](#)]
21. Chen J., Zhang C., Liu Y., et al. Experience in different modes of delivery in twin pregnancy. *PLoS One.* 2022;17(1). [[Google Scholar](#)][[DOI](#)]

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