International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Sunanda N et al. Int J Reprod Contracept Obstet Gynecol. 2025 Feb;14(2):518-522
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20250186

Original Research Article

Analysis of maternal and fetal outcome in twin pregnancy

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Received: 07 November 2024
Revised: 16 December 2024
Accepted: 02 January 2025

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ABSTRACT

Background: The use of fertility drugs, *in-vitro* fertilization, gestational age and other factors contribute to the rising incidence of multiple pregnancies. Multiple pregnancies are associated with increased risk of obstetric complications and perinatal mortality and morbidities. The present study analyzes maternal and perinatal outcomes in multiple pregnancies to identify associated complications and reduce risks.
Methods: A retrospective study was conducted in the OBG department of MMCRI, from January 2023 to December 2023. Data from 182 twin deliveries were analyzed. All women diagnosed with twin pregnancies via clinical or ultrasound examination were included.
Results: Of the 7598 deliveries recorded, 182 (3.72%) were twin deliveries. The mean maternal age was 27.32±4.5 years. Most twin pregnancies occurred in multigravida women (67.7%) and were conceived after ovulation induction (74.43%). Dichorionic twins (71.4%) were more common than monochorionic twins (19.54%). Spontaneous delivery occurred in 132 (71.4%) cases, while 28.6% were induced. The rate of LSCS was 34.67%, with the most common indication being first twin not being cephalic. Preterm labour (72.7%), anemia (42%) and hypertensive disorders (38%) and postpartum hemorrhage (14.33%) were the most common complications. Single fetal demise occurred in 10% cases 10%.
Conclusions: Twin pregnancies are more common in advanced maternal age and often result from fertility treatments. Early diagnosis, vigilant prenatal and postnatal care and timely intervention can significantly reduce maternal and perinatal risks.

Keywords: Dichorionic twins, Monochorionic twins, Multiple pregnancies, Preterm labour

INTRODUCTION

Twin pregnancies are a unique phenomenon in obstetrics, marked by increased complexity and elevated risks compared to singleton pregnancies. Despite constituting about 2 to 4% of the total number of births of total pregnancies globally, twins contribute disproportionately to maternal and perinatal morbidity and mortality.[1] Twin pregnancy rates vary globally, ranging from fewer than 8 per 1,000 births in regions such as East, Southeast, and Southern Asia, India, and Oceania, to between 9 and 16 per 1,000 births in the United States and Latin America, and over 17 per 1,000 births in Africa. The highest rates are observed in Nigeria, while Japan records the lowest. These variations are primarily attributed to the frequency of dizygotic twin pregnancies, as monozygotic twin pregnancies occur at a relatively constant rate of 3.5 to 4 per 1,000 births worldwide.[1]

The rise in twin pregnancies has been largely driven by medical and demographic changes. ART, including in vitro fertilization (IVF) and ovulation induction, has played a pivotal role in increasing twin birth rates.[2,3] Additionally, older maternal age, a demographic trend in

many societies is associated with a higher likelihood of hyperovulation, further amplifying the incidence of twins[4]. Twin pregnancies are classified based on their zygosity (monozygotic or dizygotic) and chorionicity (monochorionic or dichorionic). Each classification has distinct implications for maternal and fetal health. Monochorionic twins, for instance, face elevated risks of twin-to-twin transfusion syndrome (TTTS) and selective intrauterine growth restriction (sIUGR) due to shared placental vasculature.[5] Conversely, dichorionic twins, while at comparatively lower risk, are still predisposed to complications such as preterm birth and low birth weight.[6]

Women carrying twins experience a heightened physiological burden, predisposing them to complications like hypertensive disorders, anemia, gestational diabetes, and postpartum hemorrhage (PPH). Maternal death (MD) associated with a twin pregnancy is 2.5-fold higher than in a singleton pregnancy.[7] Perinatal mortality rates in twins are two to three times higher compared to singleton newborns, largely attributable to factors such as preterm delivery, fetal growth restriction (FGR), low birth weight (LBW), and intrapartum asphyxia.[1]

Preterm birth is a hallmark of twin pregnancies, with over 50% delivering before 37 weeks of gestation.[8] Preterm delivery exposes neonates to risks such as respiratory distress syndrome, intraventricular hemorrhage, and sepsis. Furthermore, intrauterine growth restriction (IUGR), often exacerbated by placental insufficiency, contributes to low birth weight and long-term developmental challenges.[9] Neonatal outcomes in twins also vary significantly with chorionicity, a factor that necessitates tailored antenatal care protocols.

Despite significant advancements in obstetric care, the literature on maternal and fetal outcomes in twin pregnancies remains fragmented. Most studies focus on highly specific populations, leaving a paucity of data on naturally conceived twins.[1,4,6,7] Moreover, the majority of research originates from high-income countries, limiting its applicability to low- and middle-income settings. Studies that associate twin pregnancy with the new concepts of severe maternal outcome (SMO) and maternal near-miss (MNM) are even rare.

The primary objective of this retrospective study was to evaluate aspects associated with the epidemiology of twin pregnancy, highlighting not only the clinical aspects, but also maternal and neonatal morbidity and near-miss issues that are much less studied.

METHODS

This retrospective study was conducted using medical records of antenatal women admitted to the Obstetrics and Gynecology Department at Cheluvamba Hospital, Mysore Medical College and Research Institute (MMCRI), Mysuru. The study covered a 12-month period from January 2023 to December 2023 and included all women admitted with a clinical or ultrasound diagnosis of twin pregnancies, irrespective of chorionicity. Cheluvamba Hospital, a tertiary referral centre equipped with obstetric HDU and ICU facilities, provided the study population, comprising all twin gestation cases and their complications during the study period. Maternal and fetal outcomes were analysed using data retrieved from admission and delivery records. Comparison was made between singleton and twin gestation women who presented with complications such as anemia, preterm labor, hypertensive disorders in pregnancy, post-partum hemorrhage, need for operative interference and maternal deaths among others. Fetal complications such as prematurity, IUGR, LBW, IUD, birth asphyxia, neonatal deaths and neonatal deaths.

Data extraction followed a structured format, capturing variables like maternal age, clinical findings, parity, gestational age, booking status, delivery mode, and maternal and neonatal outcomes. Ethical approval for the study was obtained from the Institutional Ethics Committee of MMCRI. Data compilation was performed using MS Excel, and statistical analysis was conducted using STATISTICA version 9.

RESULTS

A total of 7598 deliveries were recorded in Cheluvamba hospital over the 12 months period. 182 were twin deliveries (3.72%). Mean maternal age was 27.32±4.5 years for the twin pregnancies. Twins were seen more in multigravida (67.7%) as compared to the primigravida (28.8%), of which majority were conceived after ovulation induction (74.43%). Dichorionic twins were more (71.4%) compared to monochorionic twins (19.54%). In 182 deliveries, 132 (71.4%) were spontaneous and 50 were induced. The rate of LSCS seen in twin pregnancy were (34.67%), most common indication being first twin not cephalic. LSCS for second twin were done in 13 cases (7.9%), most common indication being cord prolapse. Preterm labor (72.7%), anemia (42%) and hypertensive disorders (38%) and PPH (14.33%) were the most common complication in the twin pregnancies. Single fetal demise was seen in 18 cases (10%).

Sociodemographic and clinical characteristic of the study population

The age of the twin gestation ranged between 15 and 45 years with a median of 26.00 and a mean age of 27.32±4.5 years. 18 cases are booked cases under MMCRI of the twin pregnant mothers were booked for antenatal care, 152 percent were referred case.

Outcomes of the study population

Parity: Primigravida are 55 (28.8%) and 127 multigravida (67.6%), hence more common in multigravida.

Mode of conception: 131 (74.43%) pregnancies are conceived after ovulation induction, mostly seen after ovulation induction.

Chorionicity: 46 (19.54%) of them are monochorionic and 113 (71.4%) are dichorionic twin gestations.

Mode of delivery: Delivery route is vaginal in 124 patients (68.13%) and caesarean section in 58 (34.67%).

Maternal complications: maternal complications like Anemia (42%), pre term labor (72.7%), hypertensive disorders in pregnancies of (38%), post-partum hemorrhage is seen in (14.33%)

Birth weight of first twin: Average birth weight of first twin is 2.02kgs.

Birth weight of second twin: Average birth weight of second twin is 1.77kgs.

Table 1: Sociodemographic characteristics of the study population.

Variable		No. of observation	Mean age
Age in years	<20	4	19
	20-29	83	27.32
	30-39	64	33.64
	>40	9	43.1
Marital status	Single	0	-
	Married	182	-
	Divorced	0	-
Booking status	In hospital booked	18	-
	Referred case	152	-

Table 2: Outcomes of the study population.

Outcomes		Number	%
Parity	Primigravida	55	28.8
	Multigravida	127	67.6
Conceived after ovulation induction		131	74.43
Chorionicity	Monochrorionic	56	19.54
	Dichorionic	126	71.4
Number of sections		55	34.67
Maternal complications	Preterm labor	46	72.7
	Anemia	113	42
	Hypertensive disorders in pregnancy	65	38
	PPH	24	14.3
Birth weight	First twin	2.02 Kgs	NA
	Second twin	1.77 Kgs	NA

DISCUSSION

Twin pregnancy is a rare condition that should be considered in vital statistics assessments. Vital statistics refer to continuous routine birth and death registries in a certain population. These registries can be integrated into a national surveillance program, in which rare conditions can be identified. Rare conditions are hardly identified in sample analyses but are easily identified in national-scale analyses.

Health records allow the surveillance and investigation of mortality, contributing to population-based indicators, such as fertility and mortality, by assessing the participation of individuals in economic, social, political life, safety and sustainability. From the birth registries, people are recognized and counted, broadening government responsibility and maximizing the access to human rights for the most vulnerable and marginalized population. Registries provide a basis for decision-making in public health policies that also involve social issues and enable the development of interventions with better financial management and universal health care coverage.

In the present study, 182 out of the 7598 deliveries were twin deliveries (3.72%). A study by Upreti et al showed that the frequency of twin pregnancy was 1 in 52 pregnancies or 1.9% [10]. In another similar study by Kuppan et al in Chennai, a twining rate of 19.3 per 1000 births was observed which was considered as a higher rate as compared to the overall rate in the past.[11] Twin deliveries, despite their relatively low incidence, are gaining prominence as a significant health concern due to their disproportionately high contribution to maternal and neonatal morbidity and mortality. Twin pregnancies are inherently high-risk, with increased rates of complications which place a substantial burden on healthcare systems and necessitate advanced medical resources. Secondly, the rising use of assisted reproductive technologies (ART) and the trend toward delayed childbearing have led to an increased prevalence of multiple pregnancies, further amplifying their impact.

Twins were seen more in multigravida (67.7%) as compared to the primigravida (28.8%) of which majority were conceived after ovulation induction (74.43%).

In the present study, dichorionic twins were more (71.4%) compared to monochorionic twins (19.54%). A similar study by Gigi et al which evaluated chorionicity and its impact on perinatal outcomes in twins also found that the incidences of

monochorionic and dichorionic twins were 38.7% and 61.3% respectively.[12] Perinatal outcomes in twin pregnancies are closely linked to chorionicity. Monochorionic twins, sharing a single placenta, face higher risks of complications like twin-to-twin transfusion syndrome (TTTS), selective intrauterine growth restriction (sIUGR), and perinatal mortality due to shared vascular

connections. In contrast, dichorionic twins, each with their own placenta, have comparatively better outcomes but remain at risk for preterm birth and low birth weight, which are common challenges in twin pregnancies. The higher incidence of dichorionic twins, particularly in dizygotic pregnancies, underscores their predominance, while monochorionic twins, exclusive to monozygotic pregnancies, account for a smaller but riskier proportion.[12,13]

Preterm labor (72.7%), anemia (42%) and hypertensive disorders (38%) and PPH (14.33%) were the most common complication among the present study participants. A study by Sekhasaria et al. which assessed the maternal and perinatal outcomes in twin pregnancies delivered at a tertiary centre hospital in Southern Rajasthan found that preterm labor was the most common complication in 83.33% patients, followed by anemia (62.5%), hypertensive disorders (22.91%), premature rupture of membranes (20.83%) and PPH (12.5%) which were similar to the findings of our study.[14] Another similar study in this regard was a study by Kundariya et al wherein it was found that the common maternal complications associated with twin pregnancy were preterm deliveries 119 (83.8%), anemia 59 (41.5%), and PIH 17 (12%).[15] Maternal complications in twin pregnancies are primarily caused by increased physiological strain, hormonal changes, and uterine overdistension, leading to conditions such as preeclampsia, gestational diabetes, anemia, and postpartum hemorrhage. These complications significantly impact maternal health, increasing the need for medical interventions like cesarean sections and intensive postpartum care, thereby contributing to higher maternal morbidity and healthcare costs.[14,15]

In the present study, single fetal demise was seen in 18 cases (10%). As similar study by Jain et al showed an incidence of 8.1 % incidence of single fetal demise.[16] Another study by Enbom also reported that single fetal death ranges from 3.5 to 7.8 %.[17] Single fetal demise in twin pregnancies is often caused by complications such as twin-to-twin transfusion syndrome (TTTS) in monochorionic twins, placental insufficiency, or cord accidents. Maternal factors like preeclampsia and infections can also contribute. This poses significant risks to the surviving twin, including preterm birth, neurological complications, and increased perinatal mortality, necessitating vigilant monitoring and timely interventions.[17,16]

This study has few limitations. Record reviews depends on good and accurate record keeping as vital information may be lost if they are not adequately captured. The quality of information recorded in majority of the files was scanty and poor. There is no unified or standardized method or instrument for taking blood pressures, hence this potentially created an inter observer errors.

CONCLUSION

Though twin pregnancy is seen in advanced maternal age. Early diagnosis and proper management, early detection of fetal and maternal complications with thorough and postnatal vigilance, can lower maternal and fetal dangers.

Recommendations

It is recommended that strengthening of primary care services like training and education of primary care nurses should be a starting point. This will mean improved patients' education to encourage early booking, promote healthy lifestyles for intended and pregnant mothers and recognition of danger signs in pregnancy. Still at the clinic level, the health personnel should be trained and encouraged on the proper use of antenatal card.

Ultrasonography and Doppler studies are currently under utilized in the management of our patients, hence it is recommended that all doctors should be trained in basic obstetric ultrasonography to enhance early detection of complications like IUGR, TTTS, TRAP and babies in potential dangers of intrauterine death.

Good recordings and record keeping is an area of immense concern. Periodic auditing of patients' files for proper documentation should be mandated. A standardized, unique and user friendly filing system should be developed to simplify the task of retrieving and returning files. Furthermore, shelves should be built to prevent littering of files on the floor.

ACKNOWLEDGEMENTS

Authors would like to thank the Department of OBG MMCRI Mysore, and all patient of Cheluvamba hospital MMCRI Mysore for the immense source of knowledge.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Sunanda N, Nikitha R. Analysis of maternal and fetal outcome in twin pregnancy. Int J Reprod Contracept Obstet Gynecol 2025;14:518-22.