



FETOMATERNAL OUTCOMES OF MULTIPLE PREGNANCY IN A TERTIARY CARE CENTRE A COMPARITIVE STUDY

Dr Shadi Ashkar V¹, Dr Nadia Khurshid², Prof Rabia Khurshid³, Dr Saima Wani⁴, , Dr Iflah Akbar⁵ Dr Omar Hamid⁶

¹*Post graduate MBBS,MD; Department Of Obstetrics and Gynecology,Sher I institute of Medical Sciences Srinagar Jammu and Kashmir

²Assistant Professor, MBBS,MD,DNB ; Department Of Obstetrics and Gynecology,Sher I institute of Medical Sciences Srinagar Jammu and Kashmir

³Professor, MBBS,MD; Department Of Obstetrics and Gynecology,Sher I institute of Medical Sciences Srinagar Jammu and Kashmir

⁴Associate Professor, MBBS,MD:Department Of Obstetrics and Gynecology,Sher I institute of Medical Sciences Srinagar Jammu and Kashmir

⁵Senior Resident,MBBS,MD; Department Of Obstetrics and Gynecology,Sher I institute of Medical Sciences Srinagar Jammu and Kashmir

⁶Senior Resident,MBBS,MD; Department Of Obstetrics and Gynecology,Sher I institute of Medical Sciences Srinagar Jammu and Kashmir

***Corresponding Author:** Dr Shadi Ashkar V

*Viruthulliyil (H) , P O Chennara , Mangalam, Malappuram Kerala India 676561,
shadivusu@gmail.com, 8129976188

ABSTRACT

INTRODUCTION: The development of two or more than two fetuses simultaneously in a pregnant uterus is called multiple pregnancy in which twins are most common. Upcoming artificial reproductive methods has played a major role for its increasing prevalence. Multiple pregnancies are associated with significantly higher maternal and foetal complications compared to singleton pregnancies, and they require rigorous evaluation and tailored management throughout the prenatal, intrapartum, and postpartum periods.

AIM: To assess and compare fetomaternal outcomes in multiple versus singleton pregnancies.

MATERIALS AND METHODS: This comparative study was conducted in the Department of Obstetrics and Gynaecology at Sher-I-Kashmir Institute of Medical Sciences, Jammu & Kashmir, over the period from 2023 to 2024. The study population comprised two groups: 116 cases of multiple pregnancies and 116 cases of singleton pregnancies. Maternal and fetal parameters were evaluated independently for each group and subsequently analysed for comparative outcomes.

RESULTS: Among the 232 pregnancies included in the study, the majority of participants were aged between 26 and 30 years (52.6%) and were multigravida (56%), as opposed to primigravida (44%). Within the multiple pregnancy group, twin gestations accounted for 97.4%, while triplet pregnancies constituted 2.6%. The incidence of maternal and fetal complications was notably higher in the multiple pregnancy group. Maternal anemia was observed in 25% of multiple pregnancies compared to 7.85% in singleton pregnancies. Gestational hypertension occurred in 29.3% of multiple

pregnancies versus 18.1% in singleton cases. Fetal anomalies were present in 12.1% of multiple pregnancies and 4.3% of singleton pregnancies. Fetal growth restriction was reported in 34.6% of multiple pregnancies, compared to 16.7% in singleton pregnancies.

CONCLUSION: Multifetal gestation is associated with significantly adverse maternal and fetal outcomes in comparison to singleton gestation. Given the increasing prevalence of multiple pregnancies, there is a critical need for comprehensive antenatal surveillance, timely intervention to mitigate complications, and access to neonatal intensive care services.

KEY WORDS: Maternal and Fetal outcomes

INTRODUCTION

Multiple pregnancy, also known as multifetal gestation, refers to the simultaneous development of two or more fetuses within the uterus. This condition includes twins, triplets, quadruplets, and higher-order multiples. It is considered a high-risk pregnancy due to the significantly increased chances of complications for both the mother and the fetuses. Multiple pregnancies can arise either spontaneously or through assisted reproductive technologies (ART), such as in vitro fertilization (IVF). They are classified based on zygosity—monozygotic twins result from the splitting of a single fertilized ovum, leading to genetically identical offspring, while dizygotic twins develop from two separate ova fertilized by two different sperm, resulting in genetically distinct siblings. Another important classification is based on chorionicity, which refers to the number of placentas: dichorionic pregnancies have two placentas, while monochorionic pregnancies share one, the latter being associated with higher risks due to shared blood supply¹. The incidence of multiple pregnancies varies globally and is influenced by several factors, including maternal age (with higher rates in women over 35), nutritional status, ethnicity, and even seasonal variations in conception. Over recent decades, the rate of twin and higher-order multiple births increased significantly, largely due to the widespread use of ART and delayed childbearing. However, recent trends show a decline in such births, attributed to improved embryo selection techniques, the practice of transferring fewer embryos during IVF, and the use of multifetal pregnancy reduction (MFPR) to improve outcomes². Physiologically, multiple pregnancies place a greater burden on the maternal body due to the increased placental and fetal mass³. This heightened demand can lead to a range of complications. Mothers are at greater risk for conditions such as iron deficiency anemia, hyperemesis gravidarum, intrahepatic cholestasis, acute fatty liver of pregnancy, polyhydramnios, thromboembolic events, and pruritic urticarial papules and plaques of pregnancy (PUPPP). There is also a significantly higher incidence of hypertensive disorders, including preeclampsia, HELLP syndrome, and placental abruption. Additionally, preterm labour, preterm premature rupture of membranes (PPROM), gestational diabetes, chorioamnionitis, and postpartum haemorrhage are more common in multifetal gestations⁴. The likelihood of requiring operative delivery, such as caesarean section, is also substantially increased. Fetal complications are equally concerning. In early pregnancy, there is a higher risk of spontaneous abortion and congenital anomalies. As the pregnancy progresses, risks include intrauterine growth restriction (IUGR), preterm birth, and stillbirth. Monochorionic twins, in particular, are vulnerable to unique and serious complications due to their shared placenta⁵. These include twin-to-twin transfusion syndrome (TTTS), where blood flow between twins becomes unbalanced; twin anemia-polycythemia sequence (TAPS), a milder form of TTTS; twin reversed arterial perfusion (TRAP) sequence, a rare condition where one twin develops without a functioning heart; and intertwin growth discordance, where one fetus grows significantly more than the other^{6,7}. These complications require close monitoring and, in some cases, specialized interventions to improve outcomes for both mother and babies.

METHODS

This comparative study was conducted in the Department of Obstetrics and Gynaecology at Sher-I-Kashmir Institute of Medical Sciences (SKIMS), Soura, Jammu & Kashmir, over 18 months period from 2023 to 2024. Pregnant women presenting to the hospital and diagnosed via dating scan with

either multiple or singleton pregnancies were enrolled in the study. Ethical clearance was obtained from the Institutional Ethics Committee (IEC) of SKIMS prior to commencement.

Taking into consideration 95% confidence level, 80% of power with ratio of case: control as 1:1 sample size calculated was 116 in each by Felsis without continuity correction. The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean $\pm$ SD and categorical variables were summarised as frequencies and percentages. Student's independent t-test was employed for comparison of continuous variables. Chi-square test or Fisher's exact test, whichever was appropriate, was applied for comparison of categorical variables. A p value less than 0.05 was considered statistically significant.

A total of 232 gravid women were included, comprising two groups: Group A consisted of 116 women with multiple gestations, and Group B included 116 women with singleton pregnancies.

Inclusion Criteria

- Pregnant women diagnosed by dating scan with multiple gestations, irrespective of parity, and without any pre-existing comorbidities
- Singleton pregnancies without any pre-existing comorbidities

Exclusion Criteria

- Multiple pregnancies complicated by chronic illnesses such as Type 2 diabetes mellitus, chronic hypertension, or autoimmune disorders

Participants were followed prospectively over a two-year period, beginning from the Participants were followed prospectively over 18 months, beginning from the antenatal stage through the immediate postpartum phase. Data collection focused on general demographic characteristics, maternal complications, and fetal outcomes. Specific complications associated with monochorionic pregnancies were also evaluated. All data were analyzed using standard statistical methods, and a p-value of <0.005 was considered statistically significant.

RESULTS

All collected data were systematically tabulated and analysed.

The general characteristics assessed included age distribution, parity, and type of conception. Analysis of age distribution revealed that the majority of participants in the multiple pregnancy group were aged between 26 and 30 years, accounting for 61 women (52.6%). In contrast, the highest proportion of participants in the singleton pregnancy group fell within the 31 to 40-year age range, comprising 51 women (43.9%), as detailed in Table 1.

Table 1

Age	Group A	Group B	p Value
Less than 25 years	14 (12.1%)	17(14.7%)	
26-30 years	61(52.6%)	47(40.5%)	0.48
31-40 years	40(34.4%)	51(43.9%)	
More than 40 years	1(0.9%)	1(0.9%)	

Multigravida status was more prevalent among study participants. In Group A (multiple pregnancies), 65 women (56%) were multigravida, while in Group B (singleton pregnancies), the number was slightly higher at 72 women (62.1%). As presented in Table 2, spontaneous conception occurred in 94 cases (81%) within Group A and in 112 cases (96.6%) within Group B

Table 2

Conception	Group A	Group B	p Value
Spontaneous	94(81%)	112(96.6%)	0.001*
Ovulation induction	15(12.9%)	4(3.4%)	
IVF	7(6%)	0(0%)	

Among the 116 cases of multiple pregnancy, the majority were dichorionic diamniotic (DCDA) twins, accounting for 76 cases (65.5%). Monochorionic diamniotic (MCDA) twins comprised 24 cases (20.7%), while monochorionic monoamniotic (MCMA) twins were observed in 12 cases (10.3%). Triplet pregnancies included one case each of trichorionic triamniotic (TCTA), triamniotic dichorionic (TADC), and triamniotic monochorionic (TAMC), representing 0.9% and 1.7% respectively.

No statistically significant association was found between the occurrence of multiple pregnancy and a positive family history of multiple gestation.

Regarding maternal outcomes, the incidence of nausea and vomiting showed a statistically significant difference between the two groups, as detailed in Table 3. (NVP= Nausea & Vomiting in pregnancy)

Table 3

NVP in Pregnancy	Group A	Group B	p Value
Yes	51(44%)	3(2.6%)	<0.001*
No	65(56%)	113(97.4%)	

According to Table 4, anemia was observed in 29 patients (25%) within Group A (multiple pregnancies) and in 9 patients (7.8%) within Group B (singleton pregnancies). Statistical analysis revealed a significant association between the incidence of anemia and the type of pregnancy, with a p-value less than 0.05.

Table 4

Maternal Anemia	Group A	Group B	p Value
Yes	29(25%)	9(7.8%)	<0.001*
No	87(75%)	107(92.2%)	

When hypertensive disorders among groups were compared 29.3% and 18.1% found to be hypertensive among Group A and Group B respectively.

Table 5

Gestational Hypertension	Group A	Group B	p Value
Yes	34(29.3%)	21(18.1%)	0.04*
No	82(70.7%)	95(81.9%)	

Other variables including gestational diabetes, gestational thrombocytopenia, antepartum hemorrhage, and postpartum hemorrhage did not demonstrate statistically significant differences between the two groups.

As shown in Table 6, fetal anomalies were identified in 14 cases (12.1%) within Group A (multiple pregnancies) and in 5 cases (4.3%) within Group B (singleton pregnancies). The remaining participants had no detectable anomalies, with 102 cases (87.9%) in Group A and 111 cases (95.7%) in Group B.

Table 6

Fetal Anomaly	Group A	Group B	p Value
Yes	14(12.1%)	5(4.3%)	0.03*
No	102(87.9%)	111(95.7%)	

Intrauterine growth restriction (IUGR) was observed more frequently in Group A (multiple pregnancies), affecting 25 patients (34.6%), compared to 8 patients (16.7%) in Group B (singleton pregnancies).

Table 7

IUGR	Group A	Group B	p Value
Yes	25(21.6%)	8(6.9%)	0.001*
No	91(78.4%)	108(93.1%)	

As presented in Table 8, the incidence of preterm delivery was significantly higher in Group A (multiple pregnancies), with 60 cases (51.7%), compared to 18 cases (15.5%) in Group B (singleton pregnancies).

Table 8

Preterm Delivery	Group A	Group B	p Value
Yes	60(51.7%)	18(15.5%)	<0.001*
No	56(48.3%)	98(84.5%)	

Table 9 shows APGAR score in two groups Low APGAR score (<7) was observed in 21 neonates (18.1%) born to women in Group A and 8 neonates (6.9%) in group B.

Table 9

APGAR Score	Group A	Group B	p Value
<7	21(18.1%)	8(6.9%)	0.02*
>7	75(64.7%)	100(86.2%)	
0	20(17.2%)	8(6.9%)	

Among the 116 cases of multiple gestation, rare complications were observed in isolated instances. Acardiac twin, conjoined twin and papyraceus twin each occurred in one case, representing 0.86% per condition. Additionally, vanishing twin syndrome was diagnosed in five participants overall. Discordant fetal growth was noted in seven cases (6%), while single fetal demise was documented in 12 participants, accounting for 10.34% of the multiple pregnancy group.

DISCUSSION

Majority of the participants in our study were between the age group of 26-30 years of age (52.6%) followed by 31-35 years (25%) which is comparable to the study by **Bhavna et al., 2013**⁸ who found the most common maternal age group was similar with 58.3%. It was noted that our study has more prevalence to multigravida (56%) than primigravida (44%) similar to **Kamalesh Kumari et al., 2019**⁹ with incidence of 51.4% for multigravida and 48.6% for primigravida. Similar results have been found in **Bijal et al., 2019**¹⁰ (primigravida-47.7%; multigravida- 52.3%) also. Majority of the participants in our study conceived spontaneously (81%) and rest of them has taken treatment either by ovulation induction (12.9%) or by IVF (6%). From the findings of **Bhakti Vijay et al., 2023**¹¹ these were similar to our findings as they show 84.4% conceived spontaneously, and 15.6% by treatment. 44% among our participants had symptoms of nausea vomiting while 3 of the control group (2.6%) had similar episode. **Bavna et al., 2013**⁸ had conducted by resemble study with case and control and had 2% among control. 29 out of 116 (25%) had anemia associated with multiple pregnancy and 7.85% had

similar episode with singleton pregnancy in our study. **Kamlaesh Kumari et al., 2019⁹** has similar statistics of around 26.8%. Gestational hypertension has found in 29.3% of the population similar to **Shoba Rani et al., 2020¹²(28.5%)** and **Bhavna et al., 2014¹³** (30%). In this study it was found that 18.1% of the singleton pregnancy also had similar episode. In this observational study around 12.1% of the participants from multiple pregnancy had fetal anomalies detected on anomaly scan whereas 4.3% of the singleton has the same. In both **Mahbod Kavesh et al., 2009¹⁴** and **Mahendra Raj et al., 2015¹⁵** has established almost similar results in their study also. It was found that 21.6% of our study population has affected by intra uterine growth restriction (IUGR) while 6.9% was affected in normal population. Concurrent result has been found in **Sri Sushma et al., 2023¹⁶** with 25.7% of the population showing restricted growth. As for the maternal complications the most common complication was found to be preterm delivery which accounts for 51.7% of the population which is concurrent to **Rajasree et al., 2015¹⁷** showing 49.6% for the same.

CONCLUSION

Multiple pregnancies have emerged as a significant challenge for obstetricians in contemporary clinical practice compared to singleton pregnancy. Assisted reproductive technologies and delayed childbearing have contributed to a rise in twin and higher-order pregnancies. Women carrying multiples face elevated risks of gestational hypertension, preeclampsia, anemia, and postpartum haemorrhage. The physiological demands on the maternal body are significantly amplified. Foetuses in multiple gestations are more likely to experience intrauterine growth restriction (IUGR), congenital anomalies, and preterm birth. Neonatal intensive care is often required.

These pregnancies require more frequent monitoring, specialized imaging, and coordinated care across disciplines. Labor and delivery are more unpredictable, often necessitating caesarean sections or advanced neonatal support.

REFERENCES

1. Machin G, Keith L. Biology of twins and other multiple pregnancies Machin G Keith L An Atlas of Multiple Pregnancy Biology and Pathology 1999; Parthenon New York, NY 13-24.
2. Ubaldi FM, Capalbo A, Colamaria S, et al. Reduction of multiple pregnancies in the advanced maternal age population after implementation of an elective single embryo transfer policy coupled with enhanced embryo selection: pre- and post- intervention study. Hum Reprod. 2015;30(9):2097–2106
3. Campbell DM. Maternal adaptation in twin pregnancy. Semin Perinatol. 1986;10(1):14–18
4. Madar H, Goffinet F, Seco A, et al. Severe acute maternal morbidity in twin compared with singleton pregnancies. Obstet Gynecol. 2019;133(6):1141–1150.
5. Devine PC, Malone FD, Athanassiou A, et al. Maternal and neonatal outcome of 100 consecutive triplet pregnancies. Am J Perinatol. 2001;18(4):225–235
6. De Lia J, Fisk N, Hecher K, et al. Twin- to- twin transfusion syndrome- - debates on the etiology, natural history and management. Ultra sound Obstet Gynecol. 2000;16(3):210–213.
7. Van Allen MI, Smith DW, Shepard TH. Twin reversed arterial perfusion (TRAP) sequence: a study of 14 twin pregnancies with acardius. Semin Perinatol. 1983;7(4):285–293.
8. Bhavana S. Study of Fetomaternal Outcome in Multifetal Gestation. *J Evol Med Dent Sci*. 2013;2(4):297-303.
9. Kumari K, Misra M, Jhanwar A, Kumari A. Fetomaternal Outcome in Twin Pregnancies: A Retrospective Analysis from a Tertiary Care Centre. J Clin Diagn Res. 2020;14(7):QC01-QC05. doi:10.7860/JCDR/2020/44917.13850.
10. Rami BD, Kaul S. Study of fetomaternal outcome in twin pregnancy. Int J Reprod Contracept Obstet Gynecol 2019;8:4762-5.
11. Kalyankar BV, Kalyankar VY, Gadappa SN, Gaikwad P. A clinical study of maternal and fetal outcome in multiple gestations. The New Indian Journal of OBGYN. 2023; 10(1): 178-82.
12. P. Shobha Rani, I. Sai Prathyusha, Rajani Kumari. A study of feto-maternal outcomes in twin gestation. IAIM, 2020; 7(1): 73-77.

13. Bhavana S, Shivanna S, Gopal N. A Study on Fetomaternal Outcome in Twin Gestation in a Tertiary Rural Health Centre. *Int J Adv Res Med Sci*. 2014;1(1):15-21.
14. Kaveh M, Ghajarzadeh M, Davari Tanha F, Nayeri F, Keramati Z, Shariat M, Ghaheri A. Pregnancy complica tions and neonatal outcomes in multiple pregnancies: a comparison between assisted reproductive techniques and spontaneous conception. *Int J Fertil Steril*. 2015; 8(4): 367-372
15. Mahendra Raj Pandey, Bikash Jang Kshetri, and Deepak Dhakal, “Maternal and Perinatal Outcome in Multifetal Pregnancy: A Study at a Teaching Hospital.” *American Journal of Public Health Research*, vol. 3, no. 5A (2015): 135-138. doi: 10.12691/ajphr-3-5A-29.
16. Nagasuri SS, Konin S, Harwal N. Obstetric and perinatal outcome of multiple pregnancy: a retrospective study. *Int J Reprod Contracept Obstet Gynecol* 2023;12:xxx-xx.
17. Katke RD, Thakre NN (2015) Multifetal Pregnancy: Maternal and Neonatal Outcome. *Obstet Gynecol Int J* 3(1): 00068. DOI: 10.15406/ ogij.2015.03.00068