RESEARCH
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A STUDY ON MATERNAL AND FETAL OUTCOME IN CASE OF TWIN PREGNANCIES IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Introduction: Twin and triplet births in India have increased significantly over the past three decades, contributing to public health issues like preterm delivery and lifelong disability. These pregnancies are influenced by genetic and environmental factors, and are prone to obstetric complications like spontaneous abortion and hypertension.

Aims: The study evaluates at prenatal outcomes including HDP, anemia, preterm labor, PPH, blood transfusions, and difficulties, as well as fetal outcomes like antenatal development and congenital abnormalities, to identify risk factors for twin pregnancies.

Materials and methods: The present study was conducted in the department of Obstetrics and Gynaecology BURDWAN MEDICAL COLLEGE AND HOSPITAL, after receiving clearance from the hospital's ethics committee. The study was place over a one-year period, from January 2021 to June 2022. The research included 32 patients.

Results: In the cohort of 12wks to 18wks, the mean Birth Weight of 2nd baby (mean± s.d.) of mothers was 1.9750±.1282.In 18wks to 24wks, the mean Birth Weight of 2nd baby (mean± s.d.) of mothers was 1.6750±.2315. In 24wks to 30wks, the mean Birth Weight of 2nd baby (mean± s.d.) of mothers was 1.6500±.2268. In Beyond 30wks, the mean Birth Weight of 2nd baby (mean± s.d.) of mothers was 1.4875±.1885.Distribution of mean Birth Weight of 2nd baby with Group was statistically significant (p=0.0004).

Conclusion: Twin pregnancies are linked to increased preterm delivery, low birth weights, congenital anomalies, and SNCU admission. Complications include IUGR, HDP, anemia, PPH, and blood transfusions. In developing countries with poor maternal nutrition, twin pregnancy increases the mother's health and fetal health. Proper antenatal care is essential to improve outcomes. However, initiating care earlier in gestation has some, but not statistically significant, effect on improving maternal and fetal outcomes associated with twin pregnancy.

Key words: Twin pregnancy. Presentation, Maternal outcome. Perinatal outcome, Pretenn labour, Low birth weight.

INTRODUCTION

The number and rate of twin and triplet and higher order multiple births have increased in India at an unprecedented pace over the past three decades, which is a public health cancer as these infants are less likely to survive and more likely to suffer lifelong disability due to preterm delivery. The treatment of anovulation and other causes of infertility contribute to the incidence of twinning. Multiple pregnancies are becoming more common due to increased use of assisted reproduction, and antepartum management of multifoetal gestation represents a major obstetric challenge due to significant risk associated with these pregnancies .Twin gestations may contribute disproportionately to perinatal mortality and morbidity worldwide. Perinatal mortality is the yardstick of obstetric services in an institution, but complications of pregnancy and labor increase perinatal loss in cases of multiple pregnancies. Multiple gestation pregnancies result from complex interactions among genetic and environmental factors, including hereditary influences, older maternal age, assisted reproductive technology (ART), and advanced parity. Multiple pregnancies are considered a high risk for obstetric complications such as spontaneous abortion, hypertensive disorders, placenta praevia, and foetal malformations. The incidence of hypertensive disorders in twin pregnancies is two to five times higher than in singleton pregnancies. The aetiology of preterm birth is not completely understood, but the association between multiple pregnancy and preterm birth is well known .Globally, multiple births account for 14% of all infant deaths, with low birth being the main factor responsible for higher perinatal mortality. Inadequate intrauterine growth and prematurity are the major causes of morbidity and mortality among twins, both of which are interrelated. Morbidity associated with twin gestation may have lifelong complications. The study evaluates at prenatal outcomes including HDP, anemia, preterm labor, PPH, blood transfusions, and difficulties, as well as fetal outcomes like antenatal development and congenital abnormalities, to identify risk factors for twin pregnancies.

ART significantly contributes to the global increase in multiple pregnancies. Although trends in multiple births have reduced between 2014 and 2018 (Baxi and Kaushal [1]2008; Vayssière et al.,[2] 2011) owing to single embryo transfer and refinements in IVF techniques, the twin pregnancy rate remains high among women undergoing ART (Khalil [3] 2021). Compared to singleton pregnancies, twin pregnancies are associated with an increase in both maternal and perinatal morbidity and mortality, with the risks of adverse outcomes being 4-fold higher for women with twins and 5-fold higher for their offspring than singleton pregnancies. Despite recent reports showing a reduction in stillbirth and neonatal mortality in twins, attributable to advances in antenatal care, invasive procedures for managing complicated monochorionic twin pregnancies, and improved neonatal care, the increased risk for twins compared to singletons remains high (Kilby et al.[4], 2019; Draper et al.[5], 2019, 2021). It is essential to establish if twin pregnancies conceived following ART have additional risks than twin pregnancies conceived naturally. This information is vital in counselling and providing targeted care, including close surveillance and appropriate management.

Existing studies vary in the reported risks of adverse maternal and perinatal outcomes in pregnancies conceived following ART (Dhont et al.[6], 1997, Hack et al.[7], 2018). Existing systematic reviews and meta-analyses include a small number of studies, provide imprecise estimates, inappropriately include cohorts with triplet pregnancies, and report on a limited number of maternal and offspring outcomes (McDonald et al[8]., 2005;). Owing to the lack of robust evidence, current guidelines on twin pregnancies provide recommendations for managing all twin pregnancies without considering the mode of conception or the magnitude of the risks.

MATERIALS AND METHODS

Study Design: - The study was designed as an observational study.

Place of Study: - The present study was conducted in the department of Obstetrics and Gynaecology BURDWAN MEDICAL COLLEGE AND HOSPITAL, after obtaining the approval from hospital's ethical committee.

Duration of Study: - This study was conducted in a period of one year from January 2021 to June 2022.

Study Population:- All antenatal women with twin pregnancy visiting the antenatal clinic and/or coming directly to the labour room (provided they have all proper investigations and antenatal check-up history from elsewhere) of Burdwan Medical College and Hospital during the study period was included. Written consent was taken from the mothers prior to enrolment in the present study. Records of all twin deliveries was collected, any antepartum complications, details of type of delivery, development of PPH, requirement of blood transfusion, birth weight of two foetuses, and requirement of SNCU admission was noted.

Sample size: - 32

- **Inclusion Criteria**

1. Twin pregnancy of any parity. attending the antenatal clinic (all already booked cases) and/or
2. Twin pregnancies directly coming to the labour room, provided they have all proper investigations and antenatal check-up history.

- **Exclusion Criteria**
  1. Singleton pregnancy.
  2. Pregnant women who refuse to participate.
  3. Twin pregnancies coming directly to the labour room without and required investigations and antenatal check-up history.
  4. Early radiologically diagnosed twin pregnancies (<12 weeks) who suffer loss of one of the twin fetuses before 18weeks of gestation.
- **Statistical Techniques used in the Study**

For statistical analysis, data were initially entered into a Microsoft Excel spread sheet and then analyzed using SPSS (version 27.0; SPSS Inc., Chicago, IL, USA) and GraphPad Prism (version 5). Numerical variables were summarized using means and standard deviations, while categorical variables were described with counts and percentages. Two-sample t-tests, which compare the means of independent or unpaired samples, were used to assess differences between groups. Paired t-tests, which account for the correlation between paired observations, offer greater power than unpaired tests. Chi-square tests (χ^2 tests) were employed to evaluate hypotheses where the sampling distribution of the test statistic follows a chi-squared distribution under the null hypothesis; Pearson's chi-squared test is often referred to simply as the chi-squared test. For comparisons of unpaired proportions, either the chi-square test or Fisher's exact test was used, depending on the context. To perform t-tests, the relevant formulae for test statistics, which either exactly follow or closely approximate a t-distribution under the null hypothesis, were applied, with specific degrees of freedom indicated for each test. P-values were determined from Student's t-distribution tables. A p-value ≤ 0.05 was considered statistically significant, leading to the rejection of the null hypothesis in favour of the alternative hypothesis.

RESULT AND ANALYSIS

Table 1: Association of PPH amongst the cohorts

Group							
PPH	**12wks to 18wks**	**18wks to 24wks**	**24wks to 30wks**	**Beyond 30wks**	**Total**	**Chi-square value**	**p-value**
No	7	7	6	6	26	.8205	0.8446
Row %	26.9	26.9	23.1	23.1	100		
Col %	87.5	87.5	75	75	81.3		
Yes	1	1	2	2	6		
Row %	16.7	16.7	33.3	33.3	100		
Col %	12.5	12.5	25	25	18.8		
Total	8	8	8	8	32		
Row %	25	25	25	25	100		
Col %	100	100	100	100	100		

Table 2: Association of development of HDP amongst the cohorts

Group							
HDP	**12wks to 18wks**	**18wks to 24wks**	**24wks to 30wks**	**Beyond 30wks**	**Total**	**Chi-square value**	**p-value**
No	7	7	6	6	26		
Row %	26.9	26.9	23.1	23.1	100		
Col %	87.5	87.5	75	75	81.3		
Yes	1	1	2	2	6		
Row %	16.7	16.7	33.3	33.3	100	0.8205	0.8446
Col %	12.5	12.5	25	25	18.8		
Total	8	8	8	8	32		
Row %	25	25	25	25	100		
Col %	100	100	100	100	100		

Table 3: Association of development of IUGR in B1, IUGR in B2 with amongst the cohorts

Group								
		12wks to 18wks	**18wks to 24wks**	**24wks to 30wks**	**Beyond 30wks**	**TOTAL**	**Chi-square value**	**p-value**
IUGR in B1	**No**	7	6	6	6	25	0.5486	0.9081
	Row %	28	24	24	24	100		
	Col %	87.5	75	75	75	78.1		
	Yes	1	2	2	2	7		
	Row %	14.3	28.6	28.6	28.6	100		
	Col %	12.5	25	25	25	21.9		
	Total	8	8	8	8	32		
	Row %	25	25	25	25	100		
	Col %	100	100	100	100	100		
IUGR in B2	**No**	8	6	6	7	27	2.6074	0.4562
	Row %	29.6	22.2	22.2	25.9	100		
	Col %	100	75	75	87.5	84.4		
	Yes	0	2	2	1	5		
	Row %	0	40	40	20	100		
	Col %	0	25	25	12.5	15.6		
	Total	8	8	8	8	32		

	Row %	25	25	25	25	100		
	Col %	100	100	100	100	100		

Figure 1: Distribution of mean birth weight (kg) of first baby among the cohorts

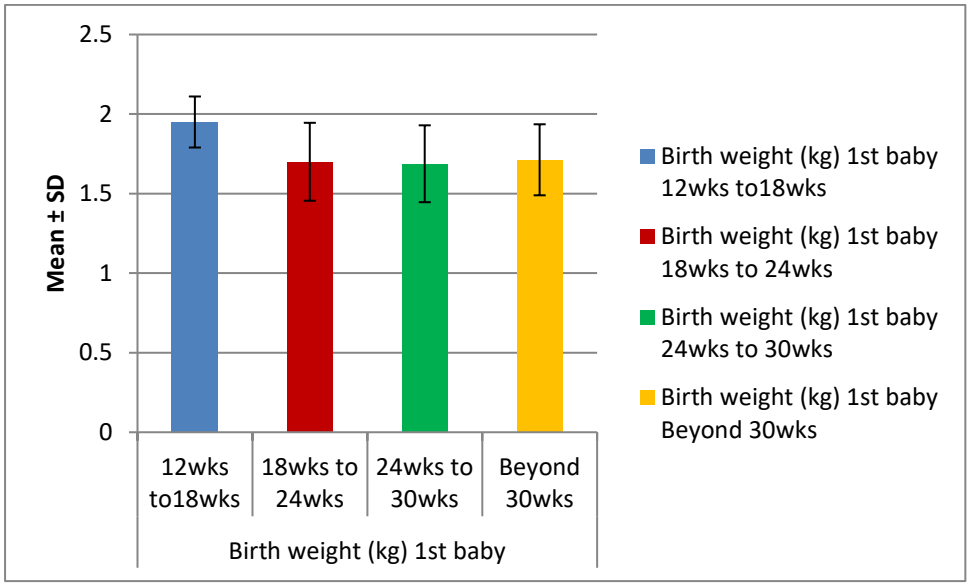
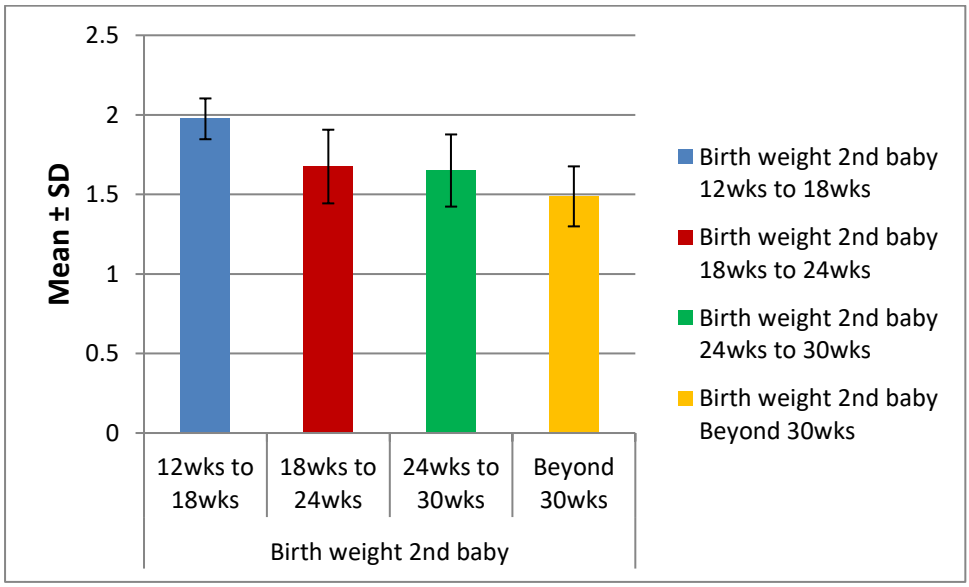


Figure 2: Distribution of mean birth weight (kg) of second baby among the cohorts



In the cohort of 12wks to 18wks, 1 (12.5%) mother developed PPH. In 18wks to 24wks, 1 (12.5%) mother developed PPH. In 24wks to 30wks, 2 (25.0%) mothers developed PPH. In Beyond 30wks, 2 (25.0%) mothers developed PPH. Association of PPH amongst the cohorts was not statistically significant (p=0.8446).In the cohort of 12wks to 18wks, 1 (12.5%) mother developed HDP. In 18wks to 24wks, 1 (12.5%) mother developed HDP. In 24wks to 30wks, 2 (25.0%) mothers developed HDP. In Beyond 30wks, 2 (25.0%) mothers developed HDP. Association of development of HDP amongst the cohorts was not statistically significant (p=0.8446).In the cohorts of 12wks to 18wks, 1 (12.5%) mother showed IUGR in B1. In 18wks to 24wks, 2 (25.0%) mothers showed IUGR in B1.In 24wks to 30wks, 2 (25.0%) mothers showed IUGR in B1. In Beyond 30wks, 2 (25.0%) mothers showed IUGR in B1.Association of development of IUGR in B1

amongst the cohorts was not statistically significant (p=0.9081).

In the cohort of 18wks to 24wks, 2 (25.0%) mothers sowed IUGR in B2. In 24wks to 30wks, 2 (25.0%) mothers sowed IUGR in B2In Beyond 30wks, 1 (12.5%) mother sowed IUGR in B2.Association of development of IUGR B2 amongst the cohorts was not statistically significant (p=0.4562)In the cohort of 12wks to 18wks, the mean birth weight (kg) of 1st baby (mean± s.d.) of mothers was 1.9500±.1604.In 18wks to 24wks, the mean Birth weight (kg) 1st baby (mean± s.d.) of mothers was 1.7000±.2449. In 24wks to 30wks, the mean Birth weight (kg) 1st baby (mean± s.d.) of mothers was 1.6875±.2416. In Beyond 30wks, the mean Birth weight (kg) 1st baby (mean± s.d.) of mothers was 1.7125±.2232.Distribution of mean Birth weight (kg) 1st baby with Group was not statistically significant (p=0.0723).In the cohort of 12wks to 18wks, the mean Birth Weight of 2nd baby (mean± s.d.) of mothers was 1.9750±.1282.In 18wks to 24wks, the mean Birth Weight of 2nd baby (mean± s.d.) of mothers was 1.6750±.2315. In 24wks to 30wks, the mean Birth Weight of 2nd baby (mean± s.d.) of mothers was 1.6500±.2268. In Beyond 30wks, the mean Birth Weight of 2nd baby (mean± s.d.) of mothers was 1.4875±.1885.Distribution of mean B Wt of 2nd baby with Group was statistically significant (p=0.0004).

DISSCUSSION

In our study, out of 32 mothers, most of the mothers were [26 (81.3%)] 21-30 years of age. Age was not statistically significant with Group (p=0.9537).

Rizwan N et al [9] (2010) showed that multiple pregnancy still warrants special attention as it is associated with increasing risk for mother and foetus. Preterm delivery increases the risk for baby. This study was conducted to evaluate the risks of pregnancy complications and adverse perinatal outcome in women with twin pregnancy. Majority of women 52 (81%) were un-booked and only 12 (18%) were booked; 54 (84%) women presented with preterm labour, 10 (15.6%) were at > or = 36 weeks of gestation. Fifty-four (84%) mothers presented with preterm labour. Anaemia was found in 42 (65.6%), and hypertension was noted in 31.2% cases. Abruptio placentae occurred in 6.2% of cases, prematurity was the major problem (54, 84.3%).

We found that, most of the mothers had Development of Anemia [5 (62.5%)] in 24wks to 30wks compared to [4 (12.5%)] Beyond 30wks and [2 (25.0%)] 18wks to 24wks but this was not statistically significant (p=0.0881). Association of PPH with Group was not statistically significant (p=0.8446).

Our study showed that, most of the mothers had Preterm [6 (75.0%)] in Beyond 30wks, 24wks to 30wks compared to [5 (62.5%)] 18wks to 24wks and [4 (50.0%)] 12wks to 18wks but this was not statistically significant (p=0.6768). Association of HDP with Group was not statistically significant (p=0.8446). Association of SNCU B1 with Group was not statistically significant (p=0.2341).

Jain D et al [10] (2014) showed that to study management and maternal and fetal outcome in single fetal death in twin pregnancies. The other fetus could be salvaged in three and all of them had a normal neonatal period. One pregnancy ended in preterm labor with delivery of a preterm baby which could not be saved. One resulted in death of the other fetus also where pregnancy was remote from term. Although their study was small, it indicates that in case of twin pregnancy with single fetal death with good surveillance, the live fetus can be salvaged.

Konar H et al [11] (2016) found that this cross-sectional observational study was undertaken to assess perinatal outcome of the second twin in respect to gestational age, presentation, mode of delivery, and birth weight. Higher perinatal mortality was observed among preterm than term ($p < 0.01$) cases, and among low birth weight than normal babies ($p < 0.05$). Second twins in vertex–vertex presentation encountered higher perinatal mortality compared to those in vertex–nonvertex and nonvertex–other presentations ($p < 0.05$). Perinatal outcome was unfavorable when both delivered vaginally than for both cesarean deliveries and cesarean after first vaginal delivery ($p < 0.01$). Preterm labor was the most frequently observed maternal complication.

It was found that, more number of mothers had IUGR in B1 [2 (25.0%)] in Beyond 30wks, 24wks to 30wks, 18wks to 24wks compared to 12wks to 18wks [1 (12.5%)] but this was not statistically significant (p=0.9081). Association of IUGR B2 with Group was not statistically significant (p=0.4562). Only 1 (3.0%) 2nd twin IUFD in one and Family history of twins.

We showed that, more number of mothers had [4 (50.0%)] REQ for blood transfusion in Beyond 30wks, 24wks to 30wks compared to [2 (25.0%)] 18wks to 24wks and 12wks to 18wks [1 (12.5%)] but this was not statistically significant (p=0.2909). Only 1 patient had Congenital Anomalies it was not statistically significant (p=0.3769). Higher number of mothers had VD [6 (75.0%)] in 24wks to 30wks compared to 18wks to 24wks, 12wks to 18wks [5 (62.5%)] and Beyond 30wks [1 (12.5%)] but this was not statistically significant (p=0.9370).

McLennan AS et al [12] (2017) showed that there is limited data on how maternal age is related to twin pregnancy outcomes. Twin live births and fetal death delivered at 20 to 42 weeks were included. Primary

outcomes included preterm birth (<34 weeks and <37 weeks), fetal death, and neonatal death at <28 days of life. Analyses of preterm birth at <34 and <37 weeks were adjusted for demographic and medical factors, with maternal age modeled using restricted spline transformations. A total of 955,882 twin live births between 2007 and 2013 were included in the analysis. Preterm birth rates at <34 weeks and <37 weeks were highest for women 15 to 17 years of age, decreased across subsequent maternal age categories, nadired for women age 35– 39 and then increased slightly for women 40 or over.

We observed that, majority number of mothers had SNCU B2 [5 (62.5%)] in Beyond 30wks compared to 24wks to 30wks and 18wks to 24wks [3 (37.5%)] though it was not statistically significant (p=0.0813).

Singh L et al [13] (2017) observed that multiple pregnancies are associated with an increased risk of obstetric complications as well as perinatal morbidity and mortality especially in developing countries. Preterm labor (74.7%), anemia (44%) and hypertensive disorders (32%) and PPH (13.33%) were the most common complication in twin pregnancies. Significantly higher rate of LSCS were seen in twin pregnancies (32.67%) as compared to singletons 18.67%. Mean weight of first twin was 2.03±0.52kg and for second twin it was 1.98±0.51kg. There was higher incidence of moderate to severe asphyxia, IUGR and higher rate of NICU admissions in twins as compared to singletons.

In our study, the mean Age was more [25.6250±4.3074] in beyond 30wks compared to [24.8750±2.5319] 12wks to 18wks, [24.0000±3.7033] 24wks to 30wks and [23.8750±2.6959] 18wks to 24wks but this was not statistically significant (p=0.7076). The mean GA in wks TOD was more [36.2500±1.4880] in 12wks to 18wks compared to 18wks to 24wks [35.3750±1.5980], 24wks to 30wks [34.8750±2.2321] and Beyond 30wks [32.8750±2.5319] which was statistically significant (p=0.0164). Distribution of mean Birth weight (kg) 1st baby with Group was not statistically significant (p=0.0723).

Silveira C et al [14] (2018) found that twin pregnancy was associated with significantly higher rates of adverse neonatal and perinatal outcomes, especially for the second twin. Factors independently associated with adverse perinatal outcomes were reported with adjusted PR (Prevalence Ratio) and 95%CI. The occurrence of severe maternal morbidity and maternal death was significantly higher among twin compared to singleton pregnancies in all regions. Twin deliveries were associated with higher rates of preterm delivery (37.1%), Apgar scores less than 7 at 5th minute (7.8 and 10.1% respectively for first and second twins), low birth weight (53.2% for the first and 61.1% for the second twin), stillbirth (3.6% for the first and 5.7% for the second twin), early neonatal death (3.5% for the first and 5.2% for the second twin), admission to NICU (23.6% for the first and 29.3% for the second twin) and any adverse perinatal outcomes (67% for the first twin and 72.3% for the second).

Lee YJ et al [15] (2019) observed that to investigate the perinatal outcomes of twin pregnancies according to maternal age. A total of 1,936 twin pregnant women were included, of which 47 (2.4%), 470 (24.3%), 948 (49.0%), 417 (21.5%), and 54 (2.7%) women were aged <25, 25–29, 30–34, 35–39, and ≥40 years, respectively. Higher maternal age was significantly associated with a higher rate of dichorionic twins and a higher risk of gestational diabetes and placenta previa. However, rates of preterm labor, preterm premature rupture of membranes, cervical incompetence, preterm delivery, preeclampsia, placenta abruption, and cesarean section were not associated with maternal age.

We found that, the mean Birth Weight 2nd baby was lower [1.4875±.1885] in Beyond 30wks compared to [1.6500±.2268] 24wks to 30wks, [1.6750±.2315], 18wks to 24wks and [1.9750±.1282] 12wks to 18wks which was statistically significant (p=0.0004).

CONCLUSION

Twin pregnancies are associated with increased incidence of preterm delivery, low birth weights, congenital anomalies and SNCU admission. They are also associated with development of complications such as IUGR, HDP, anemia, PPH and requirement of blood transfusions. In a developing country like ours where poor nutrition on mother's part is quite common, twin pregnancy increases the toll on mother's health as well as that of the fetuses in utero. Hence, proper antenatal care is essential and encouraged to improve the outcome in such pregnancies. However, our study brings to notice that initiating antenatal care from earlier weeks of gestation rather than late, though has some, but not statistically significant effect on improving the maternal and fetal outcome associated with twin pregnancy.

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