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Original Article

Comparison between the Outcome of Multiple and Singleton Pregnancy

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ABSTRACT

Background: *Multiple pregnancies are known to carry higher risks of maternal and neonatal complications compared to singleton pregnancies. Understanding these differences is crucial for improving care and outcomes. The study aimed to compare maternal and neonatal outcomes between multiple and singleton pregnancies.* ***Methods & Materials:*** *This hospital-based comparative observational study was conducted over a period of one and a half years, from July 2023 to December 2024, at the Department of Obstetrics and Gynecology, Enam Medical College and Hospital, Savar, Dhaka, Bangladesh. A total of 100 pregnant women (50 singleton and 50 multiple pregnancies) were enrolled. Data on demographic characteristics, antenatal care, pregnancy complications, delivery mode, maternal outcomes, neonatal birth outcomes, breastfeeding initiation, and NICU admissions were collected and analyzed.* ***Results:*** *A total of 100 pregnant women (50 singleton, 50 multiple pregnancies) were studied. Maternal age was similar between groups ($p > 0.05$). Multiple pregnancies had significantly lower gestational age (29.11 vs. 35.15 weeks), lower birth weight (2.04 vs. 2.65 kg), and higher rates of very low birth weight (26.0% vs. 2.0%) and preterm delivery (86.5% vs. 50.0%) ($p < 0.05$ for all). Second neonate APGAR scores were significantly lower in multiples, while first neonate scores were similar. Breastfeeding initiation was higher in singletons (86.0% vs. 64.0%; $p < 0.05$). Antenatal, postpartum complications and cesarean rates showed no significant differences.* ***Conclusion:*** *Multiple pregnancies present increased risks of adverse maternal and neonatal outcomes compared to singleton pregnancies, necessitating enhanced antenatal surveillance and specialized care.*

Keywords: *Multiple-Pregnancy, Singleton-Pregnancy, Maternal-Outcomes, Neonatal-Outcomes*

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INTRODUCTION

The incidence of multiple pregnancies has increased significantly over the past few decades, primarily due to the widespread use of assisted reproductive technologies (ART) and delayed childbearing [1,2]. Multiple gestations, while accounting for only a small percentage of total pregnancies globally, pose disproportionately higher risks to both maternal and neonatal health. These pregnancies are inherently high-risk due to the increased physiological demands on the mother and the elevated likelihood of obstetric and perinatal complications [3]. Multiple pregnancies, particularly twin gestations, occur spontaneously in about 1 in every 80 pregnancies worldwide, though the rates vary by region, ethnicity, maternal age, and the use of fertility treatments [4]. In South Asian countries, including Bangladesh, the prevalence of multiple births is lower than in Western countries, yet it remains a significant contributor to maternal and neonatal morbidity and mortality [4]. With improved access to fertility treatments and urbanization, there is a gradual rise in the number of twin and higher-order multiple gestations even in low-resource settings, making the management of such pregnancies a growing public health concern. Maternal complications associated with multiple pregnancies include anemia, preeclampsia, gestational diabetes mellitus, polyhydramnios, and an increased need for operative delivery [5]. Women carrying multiples are more likely to require hospitalization during pregnancy due to conditions such as preterm labor, antepartum hemorrhage, or fetal growth restriction. Furthermore, the postpartum period may be complicated by uterine atony, hemorrhage, and psychological stress, including postpartum depression [6]. From a fetal and neonatal perspective, multiple pregnancies are associated with an elevated risk of preterm birth, low birth weight, intrauterine growth restriction, neonatal intensive care unit (NICU) admission, and perinatal mortality [7]. Prematurity remains the single most critical determinant of adverse neonatal outcomes in multiple births. Advances in neonatal care have improved survival rates for preterm infants; however, the burden of long-term morbidity, including respiratory distress, neurodevelopmental delay, and

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feeding difficulties, continues to be higher in twins and triplets compared to singletons [8]. Given the complexity and risks associated with multiple pregnancies, their management requires multidisciplinary coordination and specialized prenatal care. Antenatal surveillance, nutritional counseling, and early identification of complications are essential to improve outcomes [9]. Despite growing international literature on the subject, there is a relative scarcity of locally generated data from low- and middle-income countries like Bangladesh, where resource limitations and healthcare disparities may influence pregnancy outcomes [10]. In the context of Bangladesh, understanding the comparative outcomes of multiple and singleton pregnancies is critical for developing tailored guidelines for clinical care and for informing health policy. This is particularly relevant in tertiary hospitals, where complicated and referred cases are often managed. An evidence-based comparison can help identify gaps in care, optimize the allocation of limited healthcare resources, and enhance maternal and neonatal survival. This study aims to compare maternal and neonatal outcomes between singleton and multiple pregnancies in a tertiary care setting in Bangladesh, thereby contributing to the evidence base needed to guide clinical practice in high-risk obstetrics.

METHODS & MATERIALS

This hospital-based comparative observational study was conducted over a period of one and a half years, from July 2023 to December 2024, at the Department of Obstetrics and Gynecology, Enam Medical College and Hospital, Savar, Dhaka, Bangladesh. The study enrolled 100 pregnant women 50 with singleton pregnancies and 50 with multiple pregnancies—using purposive sampling. Inclusion criteria included women aged 18–40 years with confirmed singleton or multiple gestations beyond 28 weeks, excluding those with congenital fetal anomalies, medically terminated pregnancies, or incomplete records. Data were collected using a structured case record form through patient interviews, clinical examinations, and hospital records. Variables recorded included maternal demographics, antenatal care, pregnancy complications, and mode of delivery, maternal and neonatal outcomes, breastfeeding initiation, and NICU admission. Gestational age was determined from the last menstrual period or early ultrasound, and neonatal parameters such as birth weight and APGAR scores were recorded immediately after delivery. Ethical approval was obtained from the Ethical Review Committee Board and written informed consent was secured from all participants. Data were analyzed using SPSS version 25.0, employing appropriate statistical tests (independent t-test, Mann–Whitney U test, chi-square, or Fisher's exact test), with a p-value <0.05 considered statistically significant.

Inclusion Criteria:

- Pregnant women aged 18 to 40 years
- Confirmed singleton or multiple gestation
- Gestational age ≥ 28 weeks at the time of admission

Exclusion Criteria:

- Known or suspected congenital fetal anomalies
- Medically terminated pregnancies
- Incomplete or missing clinical records

RESULTS

A total of 100 mothers were included—50 with singleton and 50 with multiple pregnancies. The mean maternal age was identical in both groups (26.59 ± 5.05 years). As shown in Table I, education, occupation, residence, and mode of conception were comparable between the groups. The majority of mothers in both groups were housewives (88% singleton, 84% multiple) and conceived naturally (76% singleton, 78% multiple). The average number of ANC visits was the same across both groups (6.37 ± 3.41). [Table I]

Table – I: Distribution of Study Patients by Demographic and Baseline Characteristics (*n*=102)

Variable	Singleton (n=50)	Multiple (n=50)
Age of Mother (years, mean ± SD)	26.59 ± 5.05	26.59 ± 5.05
Education: No formal education	3 (6.0%)	3 (6.0%)
Education: Primary	18 (36.0%)	18 (36.0%)
Education: Secondary	10 (20.0%)	13 (26.0%)
Education: College+	19 (38.0%)	16 (32.0%)
Occupation: Housewife	44 (88.0%)	42 (84.0%)
Occupation: Others	6 (12.0%)	8 (16.0%)
Residence: Urban	30 (60.0%)	34 (68.0%)
Residence: Rural	20 (40.0%)	16 (32.0%)
Mode of Conception: Natural	38 (76.0%)	39 (78.0%)
Mode of Conception: Assisted (IVF/IUI)	12 (24.0%)	11 (22.0%)
Number of ANC Visits (mean ± SD)	6.37 ± 3.41	6.37 ± 3.41

The mode of delivery differed between groups (Figure 1). Cesarean section was more common in singleton pregnancies (58.0%) than in multiple pregnancies (38.0%). [Figure 1]

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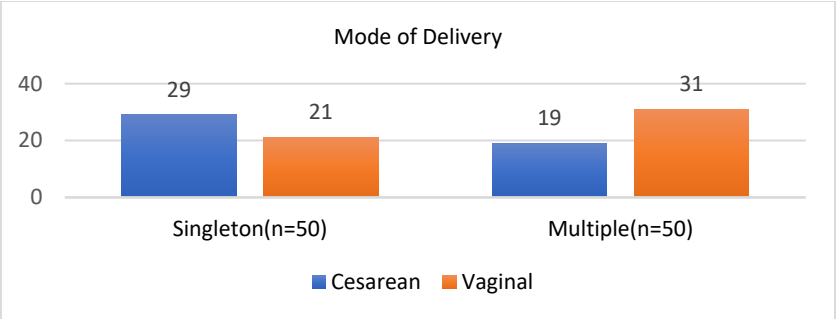

Figure – 1: Distribution of Study Patients by Mode of Delivery

Gestational age at delivery was significantly earlier in multiple pregnancies (29.11 ± 6.88 weeks) than in singleton pregnancies (35.15 ± 4.27 weeks), with a p-value < 0.01. There were no significant differences between groups in terms of mode of delivery, length of hospital stays, or postpartum complications including hemorrhage, hypertension, depression, or wound infection (p > 0.05). Notably, the proportion of women with no postpartum complications was higher in the singleton group (80.0%) than in the multiple groups (64.0%), though not statistically significant (p > 0.05). [Table II]

Table – II: Distribution of Study Patients by Maternal Outcomes for Each Pregnancy Group (*n*=102)

Outcome	Singleton (n=50)	Multiple (n=50)	P-value
Gestational Age at Delivery (weeks, mean ± SD)	35.15 ± 4.27	29.11 ± 6.88	< 0.01
Mode of Delivery: Cesarean	29 (58.0%)	19 (38.0%)	> 0.05
Mode of Delivery: Vaginal	21 (42.0%)	31 (62.0%)	> 0.05
Maternal Hospital Stay (days, mean ± SD)	3.28 ± 1.05	3.50 ± 1.59	> 0.05
Postpartum Hemorrhage	5 (10.0%)	7 (14.0%)	> 0.05
High Blood Pressure	3 (6.0%)	3 (6.0%)	> 0.05
Depression	0 (0.0%)	4 (8.0%)	> 0.05
Wound Infection	1 (2.0%)	0 (0.0%)	> 0.05
No Postpartum Complications	40 (80.0%)	32 (64.0%)	> 0.05

Among singleton pregnancies, gestational age at delivery was evenly distributed, with 50.0% delivering preterm (<37 weeks) and 50.0% at term (37–41 weeks). In contrast, the majority of multiple pregnancies (86.5%) were delivered preterm, with only 13.5% reaching term gestation. [Figure 2]

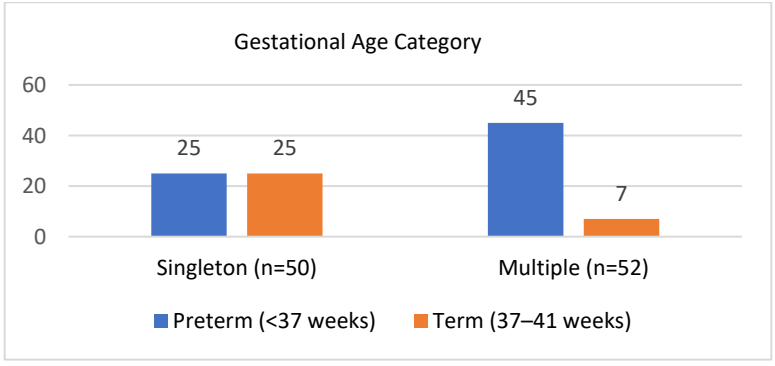

Figure – 2: Distribution of Study Patients by Gestational Age Category

Neonatal outcomes revealed significantly lower birth weights in multiple pregnancies (2.04 ± 0.67 kg) compared to singleton pregnancies (2.65 ± 0.56 kg, p < 0.01). Very low birth weight (<1.5 kg) was significantly more common in multiples (26.0% vs. 2.2%, p < 0.05). The distribution across other birth weight categories also showed significant differences (p < 0.05). APGAR scores at 1 and 5 minutes were lower for second babies in multiple pregnancies (1-min: 6.42 ± 0.97 vs. 7.12 ± 0.89; 5-min: 8.46 ± 0.90 vs. 9.18 ± 0.90), with both differences being statistically significant (p < 0.01). However, APGAR scores for the first baby showed no significant difference between groups (p > 0.05). Preterm birth was significantly more prevalent in multiples (86.5%) compared to singletons (50.0%) (p< 0.01). [Table III]

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Table – III: Distribution of Study Patients by Neonatal Birth Outcomes (*n*=102)

Neonatal Outcome	Singleton (n=50)	Multiple (n=50)	P-value
Birth Weight – Baby 1 (kg, mean ± SD)	2.65 ± 0.56	2.04 ± 0.67	< 0.01
Birth Weight Category: <1.5 kg	1 (2.0%)	13 (26.0%)	< 0.05
Birth Weight Category: 1.5–2.49 kg	12 (24.0%)	10 (20.0%)	< 0.05
Birth Weight Category: 2.5–3.99 kg	36 (72.0%)	27 (54.0%)	< 0.05
Birth Weight Category: ≥4.0 kg	1 (2.0%)	0 (0.0%)	< 0.05
1-min APGAR – Baby 1 (mean ± SD)	7.54 ± 0.84	7.37 ± 1.01	> 0.05
5-min APGAR – Baby 1 (mean ± SD)	9.60 ± 0.81	9.46 ± 0.98	> 0.05
1-min APGAR – Baby 2 (mean ± SD)	7.12 ± 0.89	6.42 ± 0.97	< 0.01
5-min APGAR – Baby 2 (mean ± SD)	9.18 ± 0.90	8.46 ± 0.90	< 0.01
Gestational Age Category: Preterm (<37 weeks)	25 (50.0%)	43 (86.0%)	< 0.01
Gestational Age Category: Term (37–41 weeks)	25 (50.0%)	7 (14.0%)	< 0.01

Breastfeeding initiation was more frequent in singleton pregnancies (86.0%) compared to multiple pregnancies (64.0%). NICU admissions were much higher in the multiple groups (92.0%) compared to the singleton group (24.0%). [Table IV]

Table – IV: Distribution of Study Patients by Breastfeeding and NICU Admission (*n*=102)

Outcome	Singleton (n=50)	Multiple (n=50)
Initiated Breastfeeding: Yes	43 (86.0%)	32 (64.0%)
Initiated Breastfeeding: No	7 (14.0%)	18 (36.0%)
NICU Admission (Any Baby): Yes	12 (24.0%)	46 (92.0%)
NICU Admission (Any Baby): No	38 (76.0%)	4 (8.0%)

Pregnancy complications were more frequent in multiple pregnancies, although differences in individual categories such as hypertensive disorders (16.0% vs. 16.0%, p > 0.05) and gestational diabetes (12.0% vs. 12.0%, p > 0.05) were not statistically significant. Preterm labor with or without PROM occurred more commonly in multiples (22.0% vs. 10.0%), and abortions (inevitable or missed) were also more frequent (16.0% vs. 6.0%), though neither reached statistical significance (p > 0.05). Notably, 50.0% of singleton pregnancies had no complications compared to only 28.0% of multiples, but the difference was not statistically significant (p > 0.05). [Table V]

Table – V: Pregnancy Complications during Gestation by Pregnancy Group (*n*=102)

Complication Category	Singleton (n=50)	Multiple (n=50)	P-value
Hypertensive Disorders	8 (16.0%)	8 (16.0%)	> 0.05
– Gestational Hypertension	2	0	
– Pre-eclampsia/Eclampsia	4	4	
– Combined with GDM/PROM	2	4	
Gestational Diabetes	6 (12.0%)	6 (12.0%)	> 0.05
Preterm Labor ± PROM	5 (10.0%)	11 (22.0%)	> 0.05
Antepartum Hemorrhage (APH)/Placenta Previa	3 (6.0%)	0 (0.0%)	> 0.05
Abortions (Inevitable/Missed)	3 (6.0%)	8 (16.0%)	> 0.05
IUGR/Oligohydramnios	2 (4.0%)	1 (2.0%)	> 0.05
Other Rare Complications	2 (4.0%)	4 (8.0%)	> 0.05
No Complications Reported	25 (50.0%)	14 (28.0%)	> 0.05

DISCUSSION

This comparative study aimed to evaluate maternal and neonatal outcomes between singleton and multiple pregnancies in a tertiary care setting in Bangladesh. The findings highlight notable differences in gestational age at delivery, birth weight, complications, NICU admissions, and breastfeeding initiation rates between the two groups. These observations are consistent with global and regional literature and underscore the higher risk associated with multiple gestations. One of the most striking findings in our study was the significantly lower gestational age at delivery in multiple pregnancies (mean 32.96 ± 2.88 weeks) compared to singleton pregnancies (mean 36.58 ± 1.91 weeks). This aligns with previous literature that consistently reports higher rates of preterm delivery among multiple gestations. According to the American College of Obstetricians and Gynecologists (ACOG), over 60% of twin pregnancies result in preterm birth before 37 weeks [11]. Similarly, a study by Kapoor et al. reported that 50% of twins were born before 37 weeks, compared to singletons [12]. Our study noted an even higher preterm birth rate among multiples (86.5%), likely reflecting the resource limitations and referral nature of the study

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center, as well as the absence of robust national preterm birth prevention program. Birth weight also varied significantly, with the mean birth weight of Baby 1 being 2.63 ± 0.38 kg in singleton pregnancies and 1.94 ± 0.38 kg in multiple pregnancies. The frequency of very low birth weight (<1.5 kg) was substantially higher among multiples (26.9%) compared to singletons (2.2%). This is consistent with findings from a large cohort study by Hiersch and Walker, which demonstrated that twins are more than five times more likely to have low birth weight than singletons [13,14]. The lower birth weights among multiples can be attributed to the shared intrauterine environment, which leads to restricted fetal growth and limited gestational duration. Neonatal outcomes also reflected the higher burden of risk in multiple pregnancies. Although APGAR scores at 1 and 5 minutes were satisfactory in both groups, multiple pregnancies had slightly lower averages, particularly for the second baby. For instance, the 1-minute APGAR score for Baby 2 was 6.23 ± 0.81 in multiples compared to 7.15 ± 0.80 in singletons. Similar patterns were reported by Odintsova et al., who found that twins have marginally lower APGAR scores than singletons, which may reflect transient difficulties in neonatal transition [15]. Another key observation was the significantly higher NICU admission rate in multiple pregnancies. According to Table 4, 92.0% of multiple pregnancies required NICU admission for at least one baby, compared to only 24.0% of singleton pregnancies. This substantial disparity highlights the increased neonatal vulnerability associated with multiple gestations, largely due to complications like prematurity and low birth weight. These findings are in line with research by Pharoah and Cooke, who highlighted that neonates from multiple pregnancies have higher rates of NICU admissions due to prematurity and associated complications [16]. Given the burden of NICU use, this highlights the need for strategic prenatal counseling and perinatal support services for multiple gestations. Maternal outcomes also revealed several differences. Postpartum complications such as hemorrhage and depression were more frequent among multiple pregnancies. Although postpartum hemorrhage occurred in both groups, the rate was slightly higher in multiples (15.4%) vs. singletons (8.0%), and postpartum depression was reported in 11.5% of mothers with multiple pregnancies, compared to 2.0% of singletons. These findings align with a study by Slomian et al., which found increased maternal morbidity and a significantly higher incidence of postpartum depression among mothers of multiples [17]. The psychological stress, increased caregiving demand, and neonatal complications associated with multiple births may contribute to these mental health challenges. The mode of delivery also differed notably between the two groups. Contrary to some expectations, vaginal delivery was more common in the multiple pregnancy groups (62.0%) than in the singleton group (42.0%), whereas cesarean section was more common in singleton pregnancies (58.0%). While literature generally reports a higher cesarean rate in multiple pregnancies due to malpresentation or fetal distress, the higher vaginal delivery rate in multiples in our cohort may reflect institutional protocols, availability of surgical support, or maternal preferences influenced by socioeconomic or cultural factors [18]. Breastfeeding initiation rates were higher among singleton mothers (86.0%) compared to mothers of multiples (64.0%). This is consistent with a study by Chen et al., who found that mothers of multiples face more challenges in initiating and sustaining breastfeeding due to neonatal prematurity, physical exhaustion, and inadequate lactation support [19]. Given the benefits of early breastfeeding, especially for low birth weight and preterm neonates, targeted lactation support interventions are crucial for mothers of multiples. Our study also explored antenatal complications. Hypertensive disorders, gestational diabetes, and preterm labor were prevalent in both groups, though certain complications were more common in multiple pregnancies. For instance, preterm labor with or without PROM was more frequent in multiple pregnancies (25.0%) compared to singletons (10.0%). Abortions, including missed and inevitable types, were also more common in multiples (17.3%) vs. singletons (4.0%). These findings are comparable to those of the NICHD Maternal-Fetal Medicine Network, which reported increased antenatal complications in multiple gestations, including higher rates of hypertension, GDM, and antepartum hemorrhage [20]. Despite these complications, it is noteworthy that 50.0% of singleton pregnancies reported no antenatal complications, whereas this was true for only 28.0% of multiple pregnancies. This discrepancy underscores the need for close monitoring and comprehensive antenatal care for women carrying multiple fetuses. Multiple gestations inherently carry greater physiological demands on the mother and often progress with higher perinatal risks.

Limitation of the Study:

The study's limitations include its single-center design, relatively small sample size, and lack of assessment of long-term maternal and neonatal outcomes.

CONCLUSION

Multiple pregnancies carry a significantly higher risk of adverse maternal and neonatal outcomes compared to singleton pregnancies, including increased rates of preterm delivery, low birth weight, and pregnancy-related complications. These findings highlight the need for careful monitoring and management to reduce associated risks.

RECOMMENDATION

It is recommended that healthcare providers implement more frequent antenatal visits and provide specialized multidisciplinary care for women with multiple pregnancies. Early identification and timely intervention for potential complications can improve both maternal and neonatal health outcomes. Additionally, raising awareness and counseling mothers about the risks and necessary precautions in multiple pregnancies are essential steps to ensure better pregnancy care.

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