

Obstetric Outcomes: A Comparison of Teenagers and Adults

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ABSTRACT

Introduction: Teenage pregnancy poses significant risks to maternal and neonatal health, particularly in low-resource settings like Nepal, where adolescent pregnancies are linked to higher morbidity and mortality. **Aims:** To compare obstetric outcome between teenage mothers and adult mothers. **Methods:** A hospital based prospective case-control study was conducted at a tertiary hospital in Nepal over six months, including 94 participants (47 teenagers aged 13–19, 47 adults aged 20–35). Data on antenatal complications, delivery methods, and postpartum outcomes were analyzed using SPSS v 24.0 with Chi-square, independent t-tests, and Fisher's exact tests. **Results:** Teenage mothers were predominantly primigravida (87.2% vs. 29.8%, $p < 0.001$) and had higher rates of intrauterine growth restriction (12.8% vs. 2.1%, $OR = 6.82$, $p = 0.046$). Adults exhibited higher cesarean deliveries (40.4% vs. 19.1%, $p = 0.002$) and gestational diabetes (4.3% vs. 0%). Postpartum complications were more frequent in adults (14.9% vs. 6.4%, $p = 0.189$), while teenagers uniquely experienced postpartum eclampsia (2.1%). The second stage of labor was prolonged in teenagers (45.89 vs. 28.75 minutes, $p = 0.001$). **Conclusion:** Teenage pregnancies are associated with intra uterine growth restriction and prolonged labor, necessitating policies to delay childbearing, improve prenatal care access, and enhance nutritional and educational support for adolescents in community.

Keywords: Adolescent pregnancy, adult pregnancy, maternal health, neonatal outcomes, obstetric complications

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INTRODUCTION

The World Health Organization describes an adolescent or a teenager as those between 13 and 19 years of age and pregnancy between the age are regarded as teenage pregnancy.¹ Pregnancy in a mother's life itself carries a lot of impact to the maternal morbidity.² Moreover, teenage pregnancy significantly increases risks of developing anemia, hypertensive disorders, and premature rupture of membrane, ruptured uterus, antepartum/postpartum hemorrhage and chorioamnionitis during/after pregnancy.^{3,4,5} These risks could possibly endanger the maternal and fetal outcome.⁶ Neonatal complications include birth asphyxia, stillbirth, neonatal deaths, intrauterine death, respiratory distress, low birth weight, neonatal sepsis, IUGR, jaundice, congenital anomalies, meconium aspiration, and low birth weight APGAR score, and so on.⁷ Teenage pregnancy stands as a major issue in Nepal since NDHS (2022) reports that motherhood or first pregnancy exists in 14% of females aged 15 to 19. The problem worsens because Nepal has significant rates of child marriage coupled with restricted healthcare access and insufficient education about sexual and reproductive health.^{9,8} The risks of teenage pregnancy

are heightened in South Asian settings like Nepal because of reduced access to quality prenatal care together with limited skilled medical assistance and limited healthcare systems.¹ This study addresses by examining age-specific obstetric risks to inform targeted interventions.¹⁰ Young mothers generally lose access to both educational and economic opportunities because of these factors which create long-term poverty and negative health results.¹¹ Research exploring the obstetric results of teenage pregnancies remains scarce throughout Nepal while the situation remains poorly studied within tertiary medical facilities. Thus this research evaluates the delivery results for teenage pregnancies treated at a tertiary hospital.

METHODS

This is a Hospital based prospective case control study conducted at Obstetrics and Gynaecology ward of Nepalgunj Medical College, Kohalpur for 6 months from October 2024 to March 2025. The estimated prevalence of teenage pregnancy was taken as 14% as per Nepal demographic and health Survey 2022 findings. The required sample size calculated according to Cochran's formula and was calculated to be 47 for both the

“cases” and “control” groups. Therefore, the total sample size comprising both the study and control group was 94. This was an unmatched case–control study; cases and controls were not matched on any demographic or obstetric variables. All eligible teenage mothers (13–19 years) presenting for delivery during the study period were consecutively enrolled-no lottery or systematic random sampling methods were used. For each teenage delivery included as a case, the next eligible delivery of an adult mother (20–35 years) was enrolled as the control. Thus, recruitment was consecutive and feasibility-based within the labor ward workflow.

All the study participants were explained about the research in detail in their native language. After obtaining informed written consent, questionnaire was filled with direct interviews on the Performa. The questionnaire was based on the normal obstetric assessment proforma in the institution and already tested survey instruments on maternal health. The expert review of two senior obstetricians served as a means of content validity. Pilot testing was also conducted using 10 participants (not included in analysis), but only slight wording changes were done to enhance clarity. Recall bias was reduced through the use of interviews after delivery and cross validation of self-reported data with the antenatal records in case possible. Research was carried out after obtaining approval from the Institutional Review Committee (IRC) of Nepalgunj Medical College. Any mothers below the 18 years of age, dual written consent from her parents and herself were obtained. The data extracted were strictly confidential.

Inclusion criteria:

1. Cases between 13-19 years of age and controls between 20-35 years who were willing to take part in the study after informed consent were included.
2. Both primigravidae and multigravidae were included in cases and control.

Exclusion criteria:

1. Any pregnancy below 13 years of age and above 35 years of age and those who didn’t wish to be included in the study were excluded from the study.
2. Pre-existing conditions like diabetes mellitus, heart diseases, chronic hypertension along with pregnancy were excluded from the study.

Statistical Analysis

Collected data were entered in specially structured proforma and analysed statistically in Microsoft Excel 2019 MSO (Version 2021 Build 16.0.14827.20158) 64-bit and IBM SPSS V 26.0 and Categorical variables were compared using χ^2 or Fisher’s exact tests; continuous variables with t-tests/Mann-Whitney U tests.

Variables:

Maternal parameters reviewed were maternal age at delivery,

gravida, period of gestation at the time of delivery, antenatal complications along stay at hospital the complications, nature of delivery (spontaneous/induced), mode of delivery (vaginal/instrumental/LSCS), total days of hospital stay during the course of delivery. Antenatal complications included pre-labor rupture of membrane (PROM), Intra-uterine Growth restriction (IUGR) (>2.5 SD below the mean weight for gestational age), oligohydramnios and anemia (Hb <9 gm/dL), infections, Pregnancy Induced Hypertension (PIH), Gestational Diabetes Mellitus (GDM), Antepartum hemorrhage (APH).

RESULTS

A total of 2728 deliveries were accounted at our hospital during the study period. The hospital's teenage (15-19) pregnancy rate was 8.43% (230/2728) compared to 86.8% adult (20-35) pregnancies (2369/2728), with 4.77% belonging to age group >35 years.

1. Demographic Characteristics

| Characteristic | Teenage | Adult | Statistical Test | p-value |
|------------------|---------------|---------------|------------------|---------|
| Primigravida (%) | 41 (87.2%) | 14 (29.8%) | χ^2 | <0.001 |
| Multigravida (%) | 6 (12.8%) | 33 (70.2%) | | |

Table 1: Baseline Comparison

Among the age group included in the study, teenagers were significantly younger (18.19 ± 0.97 years vs 26.77 ± 4.54 years) ($\Delta=8.6$ years, $p<0.001$) and were predominantly primigravida (87.2% vs 29.8%, $p<0.001$). Adults had higher parity (70.2% multigravida vs 12.8%, $p<0.001$), including 14.9% with $\geq G4$.

2. Antenatal Complications

| Complication | Teenage (n=47) | Adult (n=47) | p-value (Fisher's Exact) | Odds Ratio (95% CI) |
|---------------------|----------------|--------------|--------------------------|----------------------|
| Anemia | 5 (10.6%) | 4 (8.5%) | 0.723 | 1.28 (0.34–4.83) |
| Threatened Abortion | 1 (2.1%) | 1 (2.1%) | 1.000 | 1.00 (0.06–16.30) |
| PIH | 2 (4.3%) | 4 (8.5%) | 0.403 | 0.48 (0.08–2.82) |
| Infection (INF) | 2 (4.3%) | 6 (12.8%) | 0.133 | 0.31 (0.06–1.63) |
| GDM | 0 (0%) | 2 (4.3%) | 0.155 | - |
| APH | 1 (2.1%) | 3 (6.4%) | 0.307 | 0.31 (0.03–3.14) |
| IUGR | 6 (12.8%) | 1 (2.1%) | 0.046* | 6.82 (1.13–41.30) |

| | | | | |
|-----------------|-------------|-------------|-------|---------------------|
| Oligohydramnios | 1 (2.1%) | 2 (4.3%) | 0.558 | 0.48 (0.04–5.54) |
| PROM | 1 (2.1%) | 0 (0%) | 0.316 | - |
| Macrosomia | 0 (0%) | 1 (2.1%) | 0.316 | - |

Table II: Comparison of Antenatal Complications between study and control group

The most reported complication among the control group was infection 12.8% vs. 4.3% in study group (p=0.133, clinically notable). However, IUGR 12.8% was the most reported complication among the study group vs. 2.1% in adults (p=0.046, OR=6.82). Higher PIH trends were seen (8.5% vs. 4.3%) and GDM (4.3% vs. 0%) in adults along with higher APH (6.4% vs. 2.1%) within the control group. Macrosomia was only reported in the control group (2.1%).

3. Delivery Outcomes

| Complication | Teenage (n=47) | Adult (n=47) | p-value (χ ² /Fisher's Exact) | Risk Ratio (95% CI) |
|--------------------------|----------------|---------------|--|---------------------|
| Vaginal Delivery (VD) | 38 (80.9%) | 28 (59.6%) | 0.002* | 1.36 (1.11–1.66) |
| - Spontaneous (SVD) | 34 (72.3%) | 26 (55.3%) | 0.082 | 1.31 (0.96–1.78) |
| - Instrumental/ Assisted | 0 (0%) | 0 (0%) | - | - |
| Cesarean Section (CS) | 9 (19.1%) | 19 (40.4%) | 0.002* | 0.47 (0.24–0.93) |
| - Elective CS (EL LSCS) | 1 (2.1%) | 7 (14.9%) | 0.025* | 0.14 (0.02–1.04) |
| - Emergency CS (EM LSCS) | 8 (17.0%) | 12 (25.5%) | 0.303 | 0.67 (0.30–1.48) |

Table III: Mode of Delivery

LSCS rate was more than double in adults (40.4% vs 19.1%, p=0.002), primarily due to previous cesareans (8.5% vs 0%). Adults had 7 times higher elective CS rate (14.9% vs. 2.1%, p=0.025). CPD (11.1%), transverse lie (22.2%), PROM (11.1%) were the major indications for LSCS among the cases. However, Severe pre-eclampsia (5.3%), big baby (5.3%) were the major causes of induction in the control group.

4. Hospitalization

| Hospitalization | Teenage | Adult | p-value (t-test) |
|---------------------|-------------|-------------|------------------|
| Total Stay (days) | 3.34 ± 1.33 | 3.13 ± 0.64 | 0.421 |
| ANC Hospitalization | 2.1% | 17.0% | 0.013* |

Table IV: Duration of hospital stay among groups

We observed no difference in total stay; (3.34 ± 1.33 days,

p=0.421). Adults required more ANC admissions for obstetric related complications; and this was statistically significant (17% vs 2.1%, p=0.013).

5. Duration of Labor

| Stage | Teenage (n=38) | Adult (n=28) | p-value (Mann-Whitney) |
|-----------|--------------------|--------------------|------------------------|
| 1st Stage | 8.09 ± 1.34 hrs | 7.36 ± 1.70 hrs | 0.052 (NS) |
| 2nd Stage | 45.89 ± 21.56 mins | 28.75 ± 12.18 mins | 0.001* |

Table V: Stage-wise duration of labor

We observed no significant difference in the duration of first stage of labor (8.09 hours vs 7.36 hours, p=0.052) between the study and control groups. Teenagers had a 17-minute prolongation (45.89 minutes vs 28.75 minutes, p=0.001).

6. Postpartum Complications

| Complication | Teenage (n=47) | Adult (n=47) | p-value (Fisher's Exact) | Odds Ratio (95% CI) |
|-----------------------------|----------------|--------------|--------------------------|---------------------|
| Any Complication | 3 (6.4%) | 7 (14.9%) | 0.189 | 0.39 (0.10–1.58) |
| Postpartum Hemorrhage (PPH) | 1 (2.1%) | 2 (4.3%) | 0.558 | 0.48 (0.04–5.54) |
| Infectious Complications | 1 (2.1%) | 5 (10.6%) | 0.092 | 0.18 (0.02–1.56) |
| - Puerperal Sepsis | 1 (2.1%) | 0 (0%) | 0.316 | - |
| - Mastitis | 0 (0%) | 1 (2.1%) | 0.316 | - |
| - PP Pyrexia | 0 (0%) | 4 (8.5%) | 0.043* | - |
| Eclampsia | 1 (2.1%) | 0 (0%) | 0.316 | - |

Table VI: Complications following delivery, Infections- Mastitis, Puerperal Pyrexia, Puerperal Sepsis

Adults had higher complication rates (14.9% vs. 6.4%), though not statistically significant (p=0.189). Adults had five times higher infections (10.6% vs. 2.1%, p=0.092), driven by pyrexia (8.5% vs. 0%). But Teenagers reported unique post partum eclampsia cases (2.1%).

DISCUSSION

Teenage pregnancies accounted for 8.43% of deliveries, aligning with Nepal's national average (8-10%) but lower than rural cohorts (15-20%).¹³ The mean age of teenagers (18.2 ± 0.97 years) and adults (26.8 ± 4.5 years) reflects trends in South Asia, where early marriage persists despite legal restrictions.¹⁴ Similar age gaps were reported in Nepal (18.2 vs. 26.7 years) and Pakistan (18.4 vs. 26.5 years).^{15,16} Primigravida dominance

among teenagers (87.2% vs. 29.8%, $p < 0.001$) mirrors findings from India (90%)¹⁷ and Bangladesh (84%)¹⁸, underscoring societal pressures for early childbearing. Adults' higher parity (70.2% multigravida) aligns with regional norms favoring repeated pregnancies. IUGR was significantly higher in teenagers (12.8% vs. 2.1%, $p = 0.046$), consistent with Pathak et al (12.8% vs. 2.1%)¹⁵ and Indian studies (18%).²⁰ Biological immaturity and nutritional competition between mother and fetus likely contribute to such findings.²¹

Anemia rates were comparable (10.6% vs. 8.5%, $p = 0.723$), contrasting sharply with the study by Pathak et al (28.7% vs. 5.3%)¹⁵ and Shah et al (58% vs. 55.9%).¹⁶ PIH and GDM were lower in teenagers (4.3% vs. 8.5%; 0% vs. 4.3%), diverging from studies reporting elevated hypertensive disorders in adolescents¹⁰, teenage mothers had 6.82 times higher odds of IUGR compared to adult mothers, with a 95% confidence interval of 1.13–41.30 ($p = 0.046$) which was found consistent with the study at Karnali, Nepal.¹⁵

Lower cesarean rates in teenagers (19.1% vs. 40.4%, $p = 0.002$) align with Pathak et al (13.8% vs. 41.5%)¹⁵ and Kumar et al (18% vs. 40%).¹⁷ This contrasts with Shah et al (Pakistan), where CS rates were comparable.¹⁶ Adults' higher elective CS (14.9% vs. 2.1%, $p = 0.025$) reflects prior obstetric history (e.g., previous scars). Vaginal delivery predominance in teenagers (80.9% vs. 59.6%, $p = 0.002$) is attributed to pelvic flexibility and smaller fetal size, as reported in Nepal and India.^{15, 17}

Teenagers had a prolonged second stage (45.9 vs. 28.8 minutes, $p = 0.001$), likely due to inadequate expulsive efforts or pelvic immaturity, corroborating Egyptian studies.²³ However, first-stage duration was comparable ($p = 0.052$), contrasting with reports of prolonged labor in adolescents.²⁴ Duration for second stage of labor; in teenagers despite statistical significance, this difference is clinically modest (normal 2nd stage: ≤ 3 hours for primi).²⁸

Lower complications in teenagers (6.4% vs. 14.9%, $p = 0.189$) contrast with Shah et al (Pakistan), where infections and anemia were higher in adolescents.¹⁶ Postpartum pyrexia in adults (8.5% vs. 0%, $p = 0.043$) aligns with studies linking advanced age to infectious morbidity.²⁵ Unique eclampsia in teenagers (2.1%) highlights the need for vigilant postpartum monitoring, targeted nutrition programs for teenage mothers²⁶ even in low-risk cohorts. Overall reduction in teenage pregnancy and its complication it requires a strict bans on child marriage, as seen in Bangladesh's success.²⁷

The teenagers were predominantly primigravida and adults had higher parity which could have had an impact on cesarean section, labor and postpartum complications. These differences in nutritional status, social economic background and access to antenatal care which is not under total control also could be seen to have contributed to the increased IUGR in teenagers. Prior obstetric history of adults, including previous cesarean delivery, also contributes to the confounding of differences in mode of delivery and maternal outcome.

CONCLUSION

Teenage pregnancies showed stronger obstetric risks especially the increased rates of IUGR and longer second stage labor, whereas adult mothers had more cesarean births and postpartum infections. These results make it necessary to put greater emphasis on the antenatal nutrition programs among adolescents and early screening of risks as well as the measures that can minimize unnecessary cesarean section among adults. Specific community-based health initiatives and enhanced access to teenage reproductive health are still needed. The study did not allow evaluating long-term maternal and neonatal outcomes.

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