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Composite Maternal And Perinatal Adverse Outcomes In Pregnancies Of Adolescents And Young Adults

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Abstract:
Background
Maternal age is a critical determinant of pregnancy outcomes. Adolescents and young adult women are considered a high-risk group due to the increased incidence of both maternal and perinatal complications. Teenage pregnancies, in particular, are associated with elevated risks of fetal and infant morbidity and mortality, as highlighted by the World Health Organization (WHO). Adverse outcomes among young mothers may include anemia, pre-eclampsia, eclampsia, preterm delivery, low birth weight, and perinatal death.

INTRODUCTION:
In India, the prevalence of teenage pregnancies has shown a declining trend over time. According to data from the National Family Health Surveys (NFHS), teenage pregnancy rates were 16% during NFHS-3 (2005–2006), dropped to 7.8% in NFHS-4 (2015–2016), and remained relatively stable at 7.9% in NFHS-5 (2019–2021). In response to ongoing concerns about maternal and child health, the Government of India has proposed raising the minimum legal age of marriage for women from 18 to 21 years. This policy aims to improve maternal health outcomes and empower women by encouraging delayed childbearing and increased educational and economic opportunities.
Young adult women, often defined as those under 25 years of age, may still face significant obstetric risks, particularly those in the early young adult category (under 21 years). Existing literature suggests that outcomes improve with advancing maternal age up to a certain point, likely due to greater physiological maturity and increased access to healthcare and social support.

OBJECTIVE:
The primary objective of this study was to compare the prevalence of antenatal complications and feto-maternal outcomes between two age groups of young adult women: Early young adults: Women less than 21 years of age and Late young adults: Women aged 22 to 30 years.
This comparison will help to further elucidate the relationship between maternal age within young adulthood and pregnancy outcomes, providing evidence that may support future public health policies and clinical guidelines.

METHODOLOGY: This was a retrospective observational and comparative study conducted in the Department of Obstetrics and Gynaecology at Apollo Institute of Medical Sciences and Research, Hyderabad, over a four-year period from January 2022 to December 2025. A total of 566 pregnant women, aged below 30 years and who delivered at the institute during the study period, were included in the study. Participants were categorized into two age-based groups: Group A – Early Young Adults: Women aged less than 21 years (n = 283). Group B – Late Young Adults: Women aged 22 to 30 years (n = 283). Data were collected retrospectively from hospital case records, including antenatal history, delivery details, and postpartum follow-up. The variables studied included: Antenatal complications (e.g., anemia, pre-eclampsia, gestational diabetes), Mode of delivery (vaginal, assisted, or cesarean), Neonatal outcomes (e.g., birth weight, APGAR

score, NICU admissions), Intrapartum and postpartum complications (e.g., hemorrhage, infections).
The primary objective was to compare the prevalence of maternal and neonatal complications between the two age groups to determine whether maternal age influences fetomaternal outcomes.

Statistical Analysis:
The sample size was determined assuming a 95% confidence interval and 80% power, with an estimated prevalence of postpartum complications of 10% in one group and 4% in the other. The calculated minimum sample size was 283 participants per group. Data were entered and analyzed using SPSS (Statistical Package for the Social Sciences), Version 24. Quantitative variables (e.g., maternal age, birth weight) were summarized as mean ± standard deviation. Qualitative variables (e.g., presence of complications, mode of delivery) were expressed as frequencies and percentages. Independent samples t-test was used to compare mean values between the two groups. Chi-square test was used to assess associations between categorical variables (e.g., age group vs. complication rates).A p-value of <0.05 was considered statistically significant.

RESULTS

A total of 566 pregnant women were included in the study, divided equally into two groups based on maternal age: Group A, comprising women aged less than 21 years (n = 283), and Group B, comprising women aged 22 to 30 years (n = 283).
The **mean age** of participants in Group A was **20.19 ± 0.72 years**, whereas in Group B, it was **25.19 ± 2.94 years**. The **mean gestational age at delivery** was similar between the groups: **38.22 ± 1.95 weeks** in Group A and **38.33 ± 1.61 weeks** in Group B.

Parameter	<21 Years (Group A)	22–30 Years (Group B)
Mean Age (years)	20.19	25.19
Standard Deviation (Age)	0.72	2.94
Mean Gestational Age (weeks)	38.22	38.34
SD of Gestational Age (weeks)	1.95	1.61

Regarding **parity**, Group A had a higher number of primigravidas (**127**) compared to Group B (**73**). Conversely, second gravida and multigravida cases were more common in Group B, with **124** and **86** patients respectively, compared to **103** and **53** in Group A. there was a statistically significant difference in their parity. (P-value <0.0001)

Parity	<21 Years (Group A)	22–30 Years (Group B)
Primigravida	127	73
G2	103	124
G3 and above	53	86
Miscarriages	48	38

The prevalence of **medical disorders during pregnancy** varied across the two groups. **Gestational diabetes mellitus (GDM)** was seen in **9** women under 21 and **4** women in the older age group. **Hypothyroidism** was the most common condition, affecting **27** in Group A and **22** in Group B. **Anemia** was observed in **8** patients in Group A and **3** in Group B. **Gestational hypertension** was recorded in **11** women under 21 and **4** women aged 22–30. **Oligohydramnios** was relatively balanced, reported in **6** younger and **7** older women. Since the prevalence of medical disorders is generally low in age group less than 30, there was no statistically significant difference in the two groups (P-value=0.59)

Medical Disorder	<21 Years (Group A)	22–30 Years (Group B)
GDM	9	4
Hypothyroidism	27	22
Anemia	8	3

Gestational HTN	11	4
Oligohydramnios	6	7

With regard to **intrapartum complications**, **premature rupture of membranes (PROM)** occurred significantly more often in Group A (**23**) than in Group B (**3**). (P value: 0.04) **Fetal distress** was comparable across groups (Group A: **10**; Group B: **8**), while **cephalopelvic disproportion (CPD)** and **stillbirth/intrauterine death (IUD)** were reported only in Group A, with **2** cases each.

Complication	**<21 Years (Group A)**	**22–30 Years (Group B)**
PROM	23	3
Fetal Distress	10	8
CPD	2	0
Stillbirth/IUD	2	0

The **mode of delivery** showed a fairly even distribution between the two groups. In Group A, **79** women had a normal vaginal delivery (NVD), **80** underwent emergency lower segment cesarean section (EM LSCS), and **124** had elective cesarean sections (EL LSCS). In Group B, **75** had NVD, **70** underwent EM LSCS, and **137** had EL LSCS. There was no statistical difference in both the groups regarding mode of delivery.

Mode of Delivery	**<21 Years (Group A)**	**22–30 Years (Group B)**
Normal Vaginal Delivery (NVD)	79	75
Emergency LSCS (EM LSCS)	80	70
Elective LSCS (EL LSCS)	124	137

Finally, **NICU admissions** were higher in the younger age group, with **42** neonates from Group A requiring NICU care compared to **32** in Group B, though this difference was not statistically significant (p-value: 0.245)

DISCUSSION

This study aimed to compare antenatal complications and feto-maternal outcomes between early young adult mothers (<21 years) and late young adult mothers (22–30 years). The findings highlight important age-related differences in parity distribution, medical and obstetric complications, and neonatal outcomes.

The mean age of women in the early young adult group was 20.19 years, while it was 25.19 years in the older group. Both groups had comparable mean gestational ages at delivery, suggesting that maternal age did not significantly affect the timing of delivery. However, parity differed considerably, with a higher proportion of primigravidas in the younger age group, which aligns with expected trends, as younger women are more likely to be experiencing their first pregnancy. This is consistent with findings by **Benedict et al. (2013)**, who reported higher obstetric risk among primigravidas due to lack of maternal physiological adaptation and limited pregnancy experience.

Medical complications such as **hypothyroidism and gestational hypertension** were more frequent in the <21 years group. Notably, **gestational diabetes mellitus (GDM)** was higher in younger women (9 vs. 4), which contrasts with many studies suggesting a higher GDM risk in older maternal age groups. This variation may be attributed to genetic, lifestyle, or socioeconomic factors specific to the study population. Previous research by **Sahu et al. (2007)** noted that maternal age <20 years is associated with increased risk for anemia and hypertensive disorders in pregnancy, supporting the trends observed in this study.

Intrapartum complications such as **premature rupture of membranes (PROM)** and **fetal distress** were more common in the younger age group. PROM was particularly high (23 cases in <21 group vs. 3 in the older group), which may reflect pelvic immaturity or infection risk in adolescent and early adult pregnancies, as suggested in the study by **Chen XK et al. (2007)**.

Regarding **mode of delivery**, cesarean section rates were high in both groups, though slightly more elective cesareans were observed in the 22–30 group (137 vs. 124). The younger group had a slightly higher rate of

emergency cesareans, which may correlate with higher incidence of intrapartum complications. This finding is supported by a study conducted by **Nair et al. (2016)**, which reported that adolescent mothers were at increased risk of obstetric interventions due to labor complications.

Neonatal outcomes showed a higher rate of **NICU admissions** in the <21 years group (42 vs. 32). This may reflect the impact of maternal complications, intrapartum stress, or suboptimal antenatal care utilization. Previous studies, including one by **Kumar et al. (2008)**, have documented that babies born to adolescent mothers are more likely to have low birth weight and require NICU care due to prematurity and fetal distress.

Overall, these findings reinforce existing evidence that early young adult pregnancies (<21 years) carry a higher risk for both maternal and neonatal complications. While late young adult women (22–30 years) are not immune to risk, they appear to have relatively better outcomes in terms of maternal health and neonatal morbidity.

CONCLUSION

Maternal age under 21 years is associated with increased rates of intrapartum complications, medical disorders in pregnancy, and adverse neonatal outcomes such as NICU admissions. These results support public health initiatives aimed at delaying the age of first pregnancy, such as raising the legal age of marriage to 21 years in India, to improve maternal and child health outcomes.

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