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Edited by Yogesh Singh Bisht & Ruby Singh
E-mail: yogeshbishttech@gmail.com & bioinformationruby@gmail.com
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A cross sectional clinico epidemiological study on teenage pregnancy at a tertiary care hospital in Central India

Nisha Akhade[1], Sheetal Hedau[2,*], Somen Bhattacharjee[2], Deepa Joshi[2,*] & Piyusha Bodke[2]

[1]Department of obstetrics and Gynaecology, Dr.Laxmi Narayan Pandey Government Medical College, Ratlam, Madhya Pradesh, India; [2]Department of obstetrics and Gynaecology, Mahatma Gandhi Memorial Medical College, Indore, Madhya Pradesh, India; *Corresponding author

Affiliation URL:
https://gmcratlam.org/
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Author contact:
Nisha Akhade - E-mail: nishaakhade318@gmail.com
Sheetal Hedau - E-mail: sheetal.achale@gmail.com
Somen Bhattacharjee - E-mail: drsomenmd@yahoo.com
Deepa Joshi - E-mail: dr_deepajoshi@yahoo.com
Piyusha Bodke - E-mail: piyushabodke@gmail.com

Abstract:
Teenage pregnancy remains a public health challenge associated with increased maternal and neonatal complications in developing countries. Therefore, it is of interest to assess the clinical profile and pregnancy outcomes of 120 adolescents aged 18–19 years at MGM College and MTH Hospital, Indore. Most participants were 18 years old (70%) and primigravida (95%), with anaemia (21.67%) and pre-eclampsia (20%) being the leading maternal complications. Low birth weight (18.33%), preterm birth (15.83%) and neonatal intensive care unit admission (16.67%) were the major neonatal outcomes. Thus, data shows the need for adolescent-focused antenatal care, early risk identification and targeted interventions to improve maternal and neonatal outcomes.

Keywords: Teenage pregnancy, anaemia, preterm labour, adolescent health, neonatal outcome

Background:
Teenage pregnancy, defined as pregnancy occurring between 10 and 19 years of age, remains a significant global public health challenge despite improvements in reproductive health services. According to the World Health Organization (WHO), approximately 21 million girls aged 15–19 years in low and middle income countries become pregnant annually, with adolescent pregnancy contributing substantially to maternal and neonatal morbidity and mortality. The burden is disproportionately high in resource-limited settings, where early marriage, poverty, inadequate education and limited access to reproductive health services remain major determinants **[1].** India accounts for one of the largest numbers of adolescent pregnancies worldwide. Data from the National Family Health Survey (NFHS-5, 2019–2021) indicate that 6.8% of girls aged 15–19 years have begun childbearing, with higher prevalence in rural and socioeconomically disadvantaged populations. Although national programs such as the Rashtriya Kishor Swasthya Karyakram (RKSK), Adolescent Reproductive and Sexual Health (ARSH) and Save Daughter, Educate Daughter have strengthened adolescent health services, disparities in awareness, contraceptive use and access to quality antenatal care continue to sustain the burden of teenage pregnancy **[2].** Adolescent pregnancy is associated with an increased risk of adverse maternal outcomes, including anemia, hypertensive disorders of pregnancy, preeclampsia, postpartum hemorrhage and operative delivery. Biological immaturity, nutritional deficiencies and delayed or inadequate antenatal care contribute to these complications. Neonates born to adolescent mothers are at greater risk of preterm birth, low birth weight, intrauterine growth restriction, stillbirth, neonatal morbidity and admission to neonatal intensive care units **[3–5].** Beyond these clinical consequences, teenage pregnancy frequently results in school discontinuation, reduced employment opportunities, psychological distress and long-term socioeconomic disadvantage, thereby perpetuating intergenerational cycles of poverty **[6, 7].** Therefore, it is of interest to assess the clinical and epidemiological profile of pregnant adolescents aged 18–19 years attending a tertiary care hospital in Central India, with emphasis on socio-demographic characteristics, maternal complications, fetal outcomes and associated risk factors.

Materials and Methods:

Study design and setting:
A hospital-based, cross-sectional clinico-epidemiological study was conducted at Mahatma Gandhi Memorial (MGM) Medical College and the associated Hospital, Indore, Madhya Pradesh, India, over a one-year period.

Eligibility criteria:
A total of 120 pregnant females aged 18–19 years who provided written informed consent were included in the study. Participants who declined consent or were unavailable for complete clinical follow-up until delivery and the immediate postnatal period were excluded.

Data collection:
Data were collected using a pre-designed and pre-validated case record form through direct interviews, clinical examination and review of hospital records. Information regarding socio-demographic characteristics, obstetric history, antenatal care, nutritional status, pregnancy-related complications, mode of delivery, maternal outcomes and neonatal outcomes was recorded. Participants were followed from admission through delivery and the immediate postnatal period to document maternal and fetal complications.

Statistical analysis:
Data were analyzed using the Statistical Package for the Social Sciences (SPSS) software (version 26; IBM Corp., Armonk, NY, USA). Continuous variables were expressed as mean ± standard deviation (SD), whereas categorical variables were presented as frequencies and percentages. Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test, as appropriate. A p value <0.05 was considered statistically significant.

Ethical considerations:

Approval was obtained from the Institutional Ethics Committee of MGM Medical College, Indore, before initiation of the study.

Results:

Anaemia was the most common maternal complication among teenage pregnancies, observed in 26 participants (21.67%), followed by pre-eclampsia in 24 (20.0%) (Table 1). Preterm labour and abortion each occurred in 19 participants (15.83%), while eclampsia was seen in 10 (8.33%) and cephalopelvic disproportion (CPD) in 7 (5.83%). Less common complications included premature rupture of membranes (PROM) in 4 participants (3.33%) and malpresentation in 2 (1.67%). Antepartum haemorrhage (APH), placenta previa and multiple gestation each occurred in one participant (0.83%), and no case of gestational diabetes mellitus (GDM) was recorded. The high frequency of anaemia and hypertensive disorders of pregnancy, with pre-eclampsia and eclampsia together affecting 28.33% of participants, reflects the nutritional deficiency, inadequate antenatal care and physiological immaturity associated with teenage pregnancy. The substantial rates of preterm labour and abortion further highlight the vulnerability of adolescent mothers and the need for early antenatal registration, iron supplementation and regular blood pressure monitoring **(Table 1).** Low birth weight was the most frequent fetal complication, affecting 18.33% of cases, followed by preterm delivery in 15.83% and intrauterine growth restriction (IUGR) in 9.17%. Stillbirth occurred in 4.17% of patients, while congenital anomalies were rare, observed in only one case (0.83%) **(Table 2).** Among 120 cases, vaginal delivery was most common, occurring in 55% of patients, followed by abortion in 20% and caesarean section in 18.3%. Ventouse-assisted and assisted breech deliveries were least frequent, each accounting for 3.3%, reflecting a predominance of vaginal deliveries with limited use of assisted methods **(Table 3).** Anaemia was present in 21.67% of cases, with moderate anaemia being the most common form (10.83%), followed by mild anaemia (6.67%). Severe anaemia affected 2.5% of patients, while sickle cell anaemia was observed in 1.67%, highlighting moderate and mild anaemia as the predominant hematological issues **(Table 4).** The most common APGAR score was 6, recorded in 27.5% of cases, followed by a score of 5 in 15% and 4 in 10%. Scores of 3 and 0 were rare, each observed in only one case (0.83%), indicating moderate neonatal adaptation in most deliveries **(Table 5).** Among the 120 patients, 76.7% (n=92) were booked for antenatal care, while 23.3% (n=28) were un-booked, indicating that the majority received planned antenatal services. This highlights better healthcare utilization among most patients, with a smaller yet notable proportion lacking prior antenatal registration **(Table 6).** Indore had the highest number of cases, accounting for 40 cases (33.33%). Khargone and Dhar followed with 17 cases (14.17%) each, while Barwani contributed 14 cases (11.67%). Dewas had 9 cases (7.5%), while districts with lower counts, including Shajapur, Rajgarh, Sehore, Katni, Alirajpur, Vidisha, Jhabua, were grouped under 'Others', contributing a total of 11 cases (9.15%) **(Table 7).**

Table 1: Distribution of teenage pregnancy according to maternal complications

Maternal Complications	Number	Percentage (%)
CPD	7	5.83
Pre – Eclampsia	24	20
Eclampsia	10	8.33
Anaemia	26	21.67
PROM	4	3.33
Pre-term labour	19	15.83
Mal presentation	2	1.67
GDM	0	0
APH	1	0.83
Placenta previa	1	0.83
multiple Gestation	1	0.83
Abortion	19	15.83

Table 2: Distribution of teenage pregnancy according to fetal complications

Fetal Complication	Number of Cases	Percentage (%)
Low Birth weight	22	18.33
Pre-term delivery	19	15.83
IUGR	11	9.17
Congenital anomaly	1	0.83
Still birth	5	4.17

Table 3: Distribution of teenage pregnancy according to their mode of delivery

Mode of Delivery	Number	Percentage (%)
Vaginal Delivery	66	55.0
Caesarean Section	22	18.3
Ventouse Assisted	4	3.3
Assisted Breech Delivery	4	3.3
Abortion	24	20.0
Total	120	100

Table 4: Distribution of teenage pregnancy according to severity of anaemia

Anaemia	Count	Percentages (%)
No Anaemia	94	78.33
Mild Anaemia	8	6.67
Moderate Anaemia	13	10.83
Severe Anaemia	3	2.5
Sickle Cell Anaemia	2	1.67
Total	120	100

Table 5: Distribution teenage pregnancy according to newborn APGAR score

APGAR score	Count	Percentage (%)
0	1	0.83
3	1	0.83
4	12	10
5	18	15
6	33	27.5
7	10	8.33
8	10	8.33

Table 6: Distribution of teenage pregnancy according to their antenatal status

Antenatal Status	Count	Percentage
Booked	92	76.67
Un-booked	28	23.33
Total	120	100

Table 7: District wise distribution of teenage pregnancy

District	Number	Percentage (%)
Indore	40	33.33
Khargone	17	14.17
Dhar	17	14.17
Barwani	14	11.67
Dewas	9	7.5
Ujjain	4	3.33
Khandwa	4	3.33
Ratlam	4	3.33
Others	11	9.15
Total	120	100

Discussion:

Our study showed that 70% of participants were 18 years old and 30% were 19 years old, indicating a predominantly homogenous distribution, similar to Anupma *et al.* **[8],** who reported 74.66% in the 18–19 year group. Gravida status revealed 95% were primigravida and 5% second-gravida, aligning with findings by Abdul Rahim *et al.* **[9]** and Shukla *et al.* **[10],** who observed 86.5% and 79.1% primigravida and 13.5% and 20.9% second-gravida, respectively. The high proportion of first-time pregnancies underscores the importance of focused maternal care strategies tailored to adolescent mothers during their initial antenatal and postnatal period. Our study revealed significant educational disparities among participants, with 27.5% educated only up to 6th–8th standard and 11.67% being illiterate. These findings align with Misunas *et al.* **[11],** which identified low educational attainment as a major risk factor for adolescent pregnancy. While Singh *et al.* **[12],** emphasized education's role in delaying childbearing. Additionally, 47.5% of participants experienced menarche at age 12 and 34.17% at age 13, marking early reproductive maturity in most. Our study revealed that 85% of marriages were non-consanguineous, with only 15% being consanguineous, indicating a notable shift from earlier findings by Swami and Prakasa Rao **[13],** who reported higher consanguinity rates of 34% and 32%, respectively. This decline may reflect growing awareness of genetic risks linked to consanguinity. Additionally, 97.5% of teenage pregnancies in our study occurred within marriage, with only 2.5% among unmarried teenagers, underscoring the association between early marriage and adolescent pregnancy. These findings are supported by Jha *et al.* **[14],** who reported 100% of cases in married teenagers, highlighting similar trends. Our study showed that most participants were from Indore (33.33%), followed by Khargone and Dhar (14.17% each), Barwani (11.67%) and fewer from Dewas, Ujjain, Khandwa, Ratlam and other regions. This pattern aligns with Mahajan *et al.* **[15],** who also reported regional disparities in teenage pregnancy rates, with Indore showing higher representation likely due to improved healthcare access and reporting. Additionally, age at marriage data revealed that 76.93% of participants married between 16–18 years, with 39.32% marrying at 17 and 37.61% at 18, highlighting early marriage as a major contributing factor to adolescent pregnancy in this population, reinforcing the need for interventions to delay marriage age. Our study found that 76.67% of participants had booked antenatal care, consistent with Girotra *et al.* emphasizing the need for improved outreach. Marriage-conception intervals varied, with 29.17% conceiving within a year, 41.67% after two years and 29.17% after three years, aligning with Girotra *et al.* **[16].** BMI distribution showed 75% had normal BMI, 22.5% were underweight and 2.5% overweight, consistent with Mahajan *et al.* **[15].** Our study observed maternal complications such as anemia (21.67%), pre-eclampsia (20%) and preterm labour (15.83%), consistent with Girotra *et al.* **[16]**. APGAR scores were predominantly moderate (4–6), with score 6 most common (27.5%). Fetal outcomes showed 56.67% term deliveries, 15.83% preterm, 15.83% abortions and 16.67% NICU admissions, similar to Jha *et al.* **[14]**.

Conclusion:

Teenage pregnancy, even at 18–19 years, carries a significant burden of maternal and fetal complications. Low socio-economic status, limited education and unbooked pregnancies were linked to anaemia, pre-eclampsia, preterm labour and low birth weight. Early pregnancy detection, comprehensive antenatal care and adolescent reproductive health interventions are urgently needed.

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