

# Maternal and Perinatal Outcomes of Adolescent Pregnancy: A Prospective Observational Study from Tamil Nadu, India

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## ABSTRACT

**Introduction:** According to the literature, adolescent women have an increased incidence of adverse pregnancy outcomes.

**Aim:** To determine the maternal and neonatal outcomes of adolescent pregnancy.

**Materials and Methods:** A hospital-based prospective observational study was conducted in the Department of Obstetrics and Gynaecology (OBG) at Tiruppur Medical College and Hospital, a tertiary care centre in Tamil Nadu, India. The study included 150 adolescent pregnant mothers, defined as pregnancies occurring between the ages of 10 and 19 years, who delivered at the facility during the study period from September 2024 to February 2025. Maternal and neonatal outcomes among these participants were analysed.

**Results:** The mean age of presentation was 18.79±0.48 years. Mean age of marriage was 17.82 years, 40% of them were educated up to high school and 84% of them were primigravida. There is an increase in incidence of obstetric complications like anaemia (34%), preeclampsia (28%), preterm labour (14%), caesarean section (28%), wound infection (8%), vaginal infection (26%) and neonatal complications like low birth weight (38%), foetal growth restriction (26%), Neonatal Intensive Care Unit (NICU) admission (12%)

**Conclusion:** The present study provides insights into the complications of adolescent pregnancy and helps us to formulate directions of action to improve our healthcare system.

**Keywords:** Anaemia, Obstetric complications, Preeclampsia, Preterm labour adolescence, Teenage pregnancy

## INTRODUCTION

Adolescent pregnancy is defined as pregnancy in adolescent girls between 10 and 19 years [1]. Compared with pregnancy in adults, adolescent pregnancy is associated with increased incidence of adverse pregnancy outcomes like foetal growth restriction, low birth weight and preterm delivery [2]. This increase in adverse outcomes is due to physiological and psychological immaturity and insufficient sexual and reproductive knowledge [3,4]. Adolescent pregnancy is an important global problem with serious social and economic impact [5,6].

Several maternal and perinatal complications can arise in teenage pregnancy, like anaemia, preeclampsia, preterm labour, vaginal infections, cephalopelvic disproportion, low birth weight, foetal growth restriction, increased caesarean section and increased incidence of operative vaginal delivery [7].

Improper utilisation of the antenatal care is a vital factor for the determination of obstetric and neonatal outcomes rather than maternal age [8]. Sexual activity at a younger age, high level of fertility, lack of education and lack of knowledge about contraceptive usage put these adolescent girls at risk of pregnancy and the adverse outcomes associated with it [9]. Even though the government has advocated many programs to improve the literacy rate of the girl child and several reproductive health education programs, the burden of teenage pregnancy continues to be high in the study population.

The primary objective of the present study was to determine the maternal and neonatal outcomes of all teenage pregnancies who delivered in the study Institute during a period of six months.

## MATERIALS AND METHODS

A hospital-based prospective observational study was conducted at the Department of OBG, Government Medical College Tiruppur, Tiruppur, Tamil Nadu, India, from September 2024 to February 2025,

after obtaining approval from the Institutional Ethical Committee. (Reference No. 76/86- 5451/ME3/2024).

**Sample size:** A total of 150 adolescent pregnant mothers who delivered in the facility during the study period were included.

**Inclusion and Exclusion criteria:** Inclusion criteria were all pregnant girls between the ages of 10 and 19 years and pregnancy was confirmed by ultrasound. Exclusion criteria were taken as women older than 19 years of age, multiple pregnancy, vesicular mole, ectopic pregnancy or other medical conditions like diabetes and hypertension and those who were not willing to participate in the study.

## Study Procedure

A structured proforma was used to collect information like age, educational status, obstetric history. Patients followed-up till discharge from the hospital. For all pregnancies in girls below 18 years of age, police intimation was given and appropriate legal action was carried out. In this region, pregnancies in girls below 18 years of age come under the Protection of Children from Sexual Offences Act (POCSO) and require police intimation. Hence, police intimation was given in all such cases and appropriate action was taken. Maternal and neonatal outcomes were recorded.

## STATISTICAL ANALYSIS

Data were entered in Microsoft Excel master sheets and analyses were done using Statistical Package for the Social Sciences (SPSS) 22.0 version. Chi-square test was applied and p-value of less than 0.05 was considered significant.

## RESULTS

A total of 3399 antenatal mothers were delivered in the study Institute within study period. The mean age of adolescent mothers was

18.79±0.48 years. Out of this, the authors selected 150 adolescent teenage pregnancies and included them in the present study.

Out of the 150 teenage pregnancies, 82% (123) of them were at 19 years of age. A total of 117 teenage mothers were housewives, accounting for 78% and 33 mothers that is 22% were working as labourers [Table/Fig-1].

Parameters	n (%)
<b>Age (in years)</b>	
16	1 (0.66)
17	2 (1.3)
18	24 (16)
19	123 (82)
<b>Education</b>	
High school	60 (40)
Middle school	54 (36)
Uneducated	36 (24)
<b>Occupation</b>	
Housewife	117 (78)
Labourer	33 (22)
<b>Marital status</b>	
Married	150 (100)
<b>Obstetric score</b>	
Primigravida	126 (84)
G2A1	15 (10)
G2P1L1	9 (6)
<b>AN visits</b>	
2 to 4 visits	87 (58)
5 to 9 visits	63 (42)

**[Table/Fig-1]:** Sociodemographic characteristics of the subjects.

Out of 150 adolescent mothers in the present study population, 42 were diagnosed with Pregnancy-Induced Hypertension (PIH), which is 28%. The incidence of LSCS is found to be 42 among 150 adolescent mothers, which accounts for 28%. Out of 150 neonates delivered by adolescent mothers, 57 of them had low birth weight, which accounted for 38%. The incidence of Intrauterine Foetal Death (IUFD) was 1 out of 150 adolescent mothers [Table/Fig-2].

Those adolescent mothers who had fewer antenatal visits had an increased incidence of anaemia. Similarly, only 4.8% (3) had PIH and associated complications in those who had five to nine antenatal visits, whereas 39 (44.8%) mothers had PIH and associated complications among those who had only two to four antenatal visits [Table/Fig-3].

## DISCUSSION

Consistent with several previous studies done worldwide, the present study also showed that adolescent pregnancy was associated with poor maternal and neonatal outcomes. This is because adolescent mothers had significantly lower level of education and less prenatal care. A similar study was done by Paladugu RK et al., in Guntur Andhra Pradesh showed the mean age of the adolescent mothers to be 18.2 years, (32%) were illiterate, (72%) were housewives similar to the present study where the mean age of adolescent mothers was 18.79±0.48 years, 36% were uneducated and 78% of the mothers were housewives [10].

Another study conducted by Devi OS et al., from Hyderabad also observed that most of the teenage mothers were primigravida (86%), similar to the present study where 84% were primi mothers [11]. A similar study by Shruthi A et al., from Karnataka showed that the mean age of adolescent mothers was 18.2 years and all 100% of them were married, similar to the present study, where all the mothers were married and the mean age was 18.7 years [12].

Parameters	n (%)
Anaemia	51 (34)
Threatened abortion	18 (12)
PIH/preeclampsia	42 (28)
GDM	6 (4)
Abruption	6 (4)
PROM/preterm labour	21 (14)
LSCS	42 (28)
Wound infection	12 (8)
Vaginal infection	39 (26)
UTI	24 (16)
Low birth weight	57 (38)
Low APGAR	24 (16)
NICU admission	18 (12)
FGR	39 (26)
IUFD/stillbirth	1 (0.66)

**[Table/Fig-2]:** Frequency and percentage of antenatal complications among teenage mothers.

GDM:Gestational diabetes mellitus; PROM:Premature rupture of membranes; LSCS: Lower segment caesarean section; UTI:Urinary tract infection; APGAR:Appearance, pulse, grimace, activity, and respiration; FGR:Foetal growth restriction

Parameters	2 to 4 AN visits n (%)	5 to 9 AN visits n (%)	p-value (Chi-square test)
Anaemia	42 (48.3%)	9 (14.3%)	<b>0.001*</b>
Threatened abortion	15 (17.2%)	3 (4.8%)	<b>0.02*</b>
PIH/preeclampsia	39 (44.8%)	3 (4.8%)	<b>0.001*</b>
GDM	0	6 (9.5%)	<b>0.003*</b>
Abruption	6 (6.9%)	0	<b>0.03*</b>
PROM/ preterm labour	15 (17.2%)	6 (9.5%)	0.17
LSCS	24 (27.6%)	18 (28.6%)	0.89
Wound infection	12 (13.8%)	0	<b>0.002*</b>
Vaginal infection	24 (27.6%)	15 (23.8%)	0.60
UTI	18 (20.7%)	6 (9.5%)	0.06
Low birth weight	48 (55.2%)	9 (14.3%)	<b>0.001*</b>
Low APGAR	21 (24.1%)	3 (4.8%)	<b>0.001*</b>
NICU admission	18 (20.7%)	0	<b>0.001*</b>
FGR	36 (41.4%)	3 (4.8%)	<b>0.001*</b>
IUFD/still birth	1 (0.66%)	0	0.13

**[Table/Fig-3]:** Comparison of the complications according to the number of Antenatal (AN) visits.

\*p-value significant

Shruthi A et al., from Karnataka showed that 76% of the mothers had proper antenatal care but, in the present study, only 42% of the mothers had regular antenatal visits [12] and according to Devi OS et al., 96% were booked mothers [11].

As seen from the results, the incidence of preeclampsia was significantly higher among teenage mothers (28%) in the present study, which was also observed in other studies like Shruthi A et al., from Karnataka had 12.8% of preeclampsia [12] and Devi OS et al., from Hyderabad [11], who had an incidence of 9% of preeclampsia among adolescent mothers. The present study showed that the teenage mothers were significantly more prone to anaemia 34% probably due to increased incidence of undernutrition, inadequate antenatal care and poor compliance to haematinics among teenage mothers, which was also observed by other studies done in different parts of the world like Indarti J et al., from Indonesia showed 30.9% of mothers (16-19 years) as anaemic [13] and Olofinbiyi BA et al., from Nigeria showed 12.6% cases had anaemia [14].

According to the present results, the incidence of preterm delivery in the present study group was 14%, similar to Shruthi A et al., from

Karnataka had 18.6% of preterm births [12] and Paladugu RK et al., in Guntur, Andhra Pradesh had 20% incidence of preterm births [10].

The LSCS rate was 28% among the present study population, similar to Shruthi A et al., from Karnataka [12], where it was 24.8% also Devi OS et al., from Hyderabad showed 31% of LSCS among teenage mothers [11]. It was also seen from the present study that teenage mothers had higher incidence of low birth weight babies. 38% of the babies were of Low Birth Weight (LBW) in the present study, similar to Shruthi A et al., from Karnataka where it was 39.1% of LBW babies [12]. Similarly, Devi OS et al., from Hyderabad had an incidence of 31% of LBW babies among adolescent mothers [11]. Future studies with larger sample sizes, multicentric participation and inclusion of comparison groups are recommended to enhance the generalisability of the findings. Long-term follow-up and assessment of socioeconomic and educational factors would further help in understanding the broader impact of adolescent pregnancy and in developing effective preventive and healthcare strategies.

### Limitation(s)

As it was conducted in a single tertiary care centre, the findings may not be generalisable to the wider population. Being a hospital-based study, it may not reflect outcomes among adolescent mothers delivering at home or in primary healthcare settings. The relatively small sample size may limit the ability to detect rare complications. Additionally, the absence of a comparison group of adult pregnant women restricts direct comparison of outcomes between adolescent and non adolescent pregnancies. Furthermore, the study assessed only immediate maternal and neonatal outcomes and long-term follow-up was not performed.

### CONCLUSION(S)

Young adolescents are physiologically immature and are more vulnerable to nutritional deficiencies, which contribute to poor outcomes. Teenagers have high risk of life-threatening complications with serious health sequelae in later life. The present study has provided insights into the complications of adolescent pregnancy that can help the authors to formulate directions of action to improve our healthcare system.

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