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Original Research Article

Teenage Pregnancy Outcomes and Determinants: Maternal Complications, Delivery Mode and Neonatal Outcome

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Abstract:

Background: Teenage pregnancy (<19 years) remains a significant public health problem in India, contributing to increased maternal and neonatal morbidity and mortality, particularly in socioeconomically disadvantaged regions.

Aim: To assess maternal complications, mode of delivery, neonatal outcomes, and determinants of teenage pregnancy in Dhanbad, Jharkhand.

Methodology: A hospital-based prospective observational study was conducted over one year at Department of Obstetrics and Gynaecology, Shahid Nirmal Mahto Medical College and Hospital, Dhanbad. A total of 170 primigravida teenage mothers (13–19 years, ≥28 weeks gestation) were enrolled. Socio-demographic details, antenatal and intrapartum complications, delivery mode, and neonatal outcomes were recorded and analyzed using descriptive statistics and appropriate tests.

Results: Most participants were aged 18–19 years (64.7%) and from lower middle socioeconomic class (50.6%). Anaemia was present in 52.9%, and hypertensive disorders in 18.9%. LSCS was performed in 48.2% cases. Low birth weight (35.3%), NICU admission (40%), prematurity (14.1%), and respiratory distress (17.6%) were common neonatal outcomes. Stillbirth and early neonatal death were 2.4% and 1.2%, respectively.

Conclusion: Teenage pregnancy is associated with significant maternal complications and adverse neonatal outcomes, underscoring the need for strengthened adolescent reproductive health services and early antenatal care.

Keywords: Teenage Pregnancy, Maternal Complications, Caesarean Section, Low Birth Weight, Neonatal Outcome, Adolescent Health.

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Introduction

Teenage pregnancies are considered to be pregnancy below the age of 19 years. Teen pregnancy is a widespread social health issue in all nations and is not only detrimental to the health of both a mother and a child but was also regarded as a high-risk condition. Teen pregnancy remains a difficult social health concern in most parts of the world, especially in the developing world. In the entire world, the world health organization estimates that approximately 16 million girls aged between 15 and 19 years and approximately 1 million girls under 15 years give birth annually, with most of it being in the low- and middle-income countries [1]. This shows the scale of the issue and importance of paying close attention to the research on maternal and neonatal outcomes in adolescent mothers.

Teenage pregnancy in India is some 8-14 percent of all pregnancies. Among the high mortality in women aged 15-19 years, complications of pregnancy and childbirth are one of the major causes of deaths in this age group in India [2]. Teenage pregnancy is of great concern thus especially in developing nations such as India where socioeconomic differences, early marriage, inaccessible reproductive health services, and poor education are some of the factors that have made it to continue. The maternal mortality rate (MMR) of adolescent mothers between 10 years and 19 years is almost five times the maternal mortality rate (MMR) of mothers aged 20 to 24 years. Besides maternal risks, teenage pregnancy also correlates with several negative fetal outcomes such as preterm birth, low birth weight, high perinatal morbidity and mortality.

The second most populous nation in the world with a population of about 1.2 billion is India, and the number of adolescents is huge, as people who are under 19 years of age comprise of about 22 percent of the total population. As the National Health Family Survey estimates, the general prevalence of teenage pregnancy in India is approximately 8%.2 Teenage pregnancy can be very challenging to both young mothers biologically, psychologically, and socially. Adolescents physiologically may not be fully developed, and this can predispose them to obstetric complications which include anemia, hypertensive disorders of pregnancy, cephalopelvic disproportion, obstructed labor and postpartum bleeding. It has been established that maternal and fetal mortality and morbidity directly depend on the age of the mother [3].

Teenage pregnancies have always been linked to increased risks to the mother and the child and the long-term health and socioeconomic outcome. The negative maternal outcomes encompass elevated levels of antepartum complications comprising anemia, pregnancy-induced hypertension, and preterm birth; intrapartum complications like protracted labor and increased rates of the operative procedures; and postpartum complications like infections and hemorrhage [4]. In the neonatal point of view, children born of teen mothers have a higher risk of prematurity, low birth weight, intrauterine growth retardation, birth asphyxia, and higher neonatal intensive care hospital admission. These are some of the outcomes that lead to perinatal morbidity and mortality [5].

Although other studies in other regions in India have investigated the outcome of teenage pregnancies, there is a regional difference because of the difference in literacy levels, culture, socio economic status, access to healthcare, and nutritional status [6]. South Indian states (especially Tamil Nadu) have reported incidence of 5.9% teenage pregnancy according to the recent statistics.3 Little information is provided by eastern states of India like Jharkhand which may have socioeconomic problems, early marriages and inadequate knowledge of reproductive health that may affect the prevalence and consequences of teenage pregnancy.

Jharkhand is described to have very high rural and tribal population, low rate of female literacy in some of the districts and inequality in access to quality antenatal and obstetric care. The Dhanbad district of the Jharkhand state is a region with its own demographic and socioeconomic characteristics. Although urbanization has happened in some pockets of the country owing to mining and industrialization, huge population still lives in rural and peri-urban regions where early marriage and child carrying in adolescence are still common. In these environments, teen mothers could lack agency in their decision-making, use of antenatal care, and have a poor nutritional state, all of which can negatively impact the outcomes of pregnancy [7].

This is to determine the determinants of teenage pregnancy in Dhanbad so that special interventions can be made. The possible causes are early age at marriage, motherhood ignorance, poverty, cultural norms that prefer early child giving birth, poor knowledge and access to contraceptives, poor sexual and reproductive health education. These determinants are critical to the identification in the local context to plan preventive measures and enhance the maternal and neonatal health outcomes.

In addition, it is worthwhile to assess the delivery method among teenage mothers to establish the fact on whether the rates of caesarean section are high among teenage mothers. Teenagers are also more susceptible to cephalopelvic disproportion since the pelvis has not fully developed and thus may cause hampered childbirth and more surgeries. On the other hand, other studies indicate that there are lower rates of caesarean among teenage mothers because of biological and demographic reasons. Thus, the evaluation of the patterns of delivery among the local population of Dhanbad will be a great contribution to the practice of obstetric management and the risks involved.

As the issue of teenage pregnancy has a tremendous burden and the complications thereof have a challenge, there is an urgent need to find region-specific data of Jharkhand and especially Dhanbad district. The bulk of literature available is provided by other states, and the results cannot also be fully applicable to this population because of differences in socioeconomic and healthcare variables. A study-based learning initiative in Dhanbad will be able to fill this knowledge gap and add to the evidence-based planning of the maternal and children health services in the area.

The current study, thus, will address the outcomes of teenage pregnancy and determinants in Dhanbad, Jharkhand, India. The aims of the proposed study include: (a) to research on maternal complications unique to teenage mothers during antepartum, intrapartum, and postpartum stages; (b) to examine the mode of delivery to find out whether the rate of caesarean section is higher in the teenage pregnancy or not; (c) to evaluate the neonatal outcome of teenage pregnancy; and (d) to research the factors that contribute to teenage pregnancy in this region. In finding these answers, the study aims to present a thorough understanding on the maternal and neonatal consequences of teenage pregnancy as well as inform the health strategies of the population to prevent the associated negative effects in the same environment as that in Dhanbad.

Methodology

Study Design: This study was a hospital-based prospective observational study conducted to assess teenage pregnancy outcomes and their determinants, with special emphasis on maternal complications, mode of delivery, and neonatal outcomes. The prospective design enabled systematic collection of clinical and outcome-related data from admission through the postpartum period.

Study Area: The study was conducted in the Department of Obstetrics and Gynecology at Shahid Nirmal Mahto Medical College and Hospital, Dhanbad, Jharkhand, India

Study Duration: The study was carried out over a period of one year.

Sample Size: A total of 170 teenage pregnant women fulfilling the inclusion criteria were included in the study. The sample size comprised all eligible primigravida teenage mothers admitted during the study period and who consented to participate.

Study Population: The study population consisted of teenage pregnant females aged 13–19 years admitted to the labor room of the Department of Obstetrics and Gynecology for delivery. Only primigravida women with a gestational age of 28 weeks or more were included to maintain uniformity in assessing maternal and neonatal outcomes. Participants were followed from admission through delivery and until discharge from the hospital.

Inclusion Criteria

- Pregnant adolescents aged 13–19 years
- Primigravida
- Gestational age ≥ 28 weeks
- Admitted for delivery during the study period
- Willing to provide informed written consent (and parental consent where applicable)

Exclusion Criteria

- Primigravida with gestational age < 28 weeks
- Primigravida ≥ 28 weeks admitted for causes other than labor
- Multigravida teenage mothers
- Pregnant women aged >19 years
- Patients unwilling to participate

Data Collection: Data were collected using a pre-designed and structured proforma. Information was obtained from antenatal records, detailed history taking, clinical examination findings, labor room records, and postpartum and neonatal records. Socio-demographic variables such as age, residence, educational status, and socioeconomic status were recorded. Obstetric details including gestational age, antenatal care visits, hemoglobin levels, and pregnancy-related complications were documented. Maternal complications such as anemia, pregnancy-induced hypertension, eclampsia, preterm labor, premature rupture of membranes, postpartum hemorrhage, and obstructed labor were noted. The mode of delivery, whether normal vaginal delivery, assisted vaginal delivery, or lower segment cesarean section along with its indications, was recorded. Neonatal outcomes including birth weight, APGAR score, prematurity, NICU admission, stillbirth, and early neonatal death were assessed and documented.

Procedure: Eligible teenage pregnant women were identified at the time of admission to the labor room. After obtaining informed consent, baseline socio-demographic and obstetric details were recorded. Participants were monitored throughout labor and delivery for any complications. Details regarding the mode of delivery and maternal outcomes were documented immediately after childbirth. Neonatal assessment was performed at birth and during the hospital stay. Mothers were followed up until discharge to record postpartum complications and neonatal outcomes.

Statistical Analysis: The collected data were entered into Microsoft Excel and analyzed using appropriate statistical software. As this was primarily a descriptive observational study, results were summarized using frequencies and percentages for categorical variables and mean with standard deviation for continuous variables. Associations between determinants and pregnancy outcomes were analyzed using the Chi-square test for categorical variables and Student's t-test for continuous variables where applicable. A p-value of less than 0.05 was considered statistically significant."

Result

Table 1 presents the socio-demographic characteristics of 170 study participants (N = 170). The majority were aged 18–19 years (110, 64.7%), followed by 16–17 years (48, 28.2%), and 13–15 years (12, 7.1%). Most participants belonged to the lower middle socio-economic class (86, 50.6%), with 52 (30.6%) from lower class and 32 (18.8%) from upper middle class. Regarding education, the largest group had secondary education (6th–10th) (76, 44.7%), followed by higher secondary (40, 23.5%), primary education (28, 16.5%), illiterate (14, 8.2%), and graduates (12, 7.1%). Overall, most participants were late adolescents from lower middle socio-economic backgrounds with secondary-level education.

Table 1: Socio-demographic characteristics of study participants (N=170)		
Variable	**N**	**%**
Age (years)		
13–15	12	7.1
16–17	48	28.2
18–19	110	64.7
Socio-economic status		
Lower class	52	30.6
Lower middle	86	50.6
Upper middle	32	18.8
Educational status		
Illiterate	14	8.2
Primary (1st–5th)	28	16.5
Secondary (6th–10th)	76	44.7
Higher secondary (11th–12th)	40	23.5
Graduate	12	7.1

Table 2 presents antenatal and maternal complications among 170 women (N = 170). Regarding anaemia, 80 women (47.1%) were not anaemic, while 62 (36.5%) had mild, 20 (11.8%) moderate, and 8 (4.7%) severe anaemia. Most women were normotensive (138, 81.1%), whereas 18 (10.6%) had gestational hypertension, 10 (5.9%) severe pre-eclampsia, and 4 (2.4%) eclampsia. Other antenatal complications included preterm labour (22, 12.9%), IUGR (18, 10.6%), PROM (16, 9.4%), and GDM (10, 5.9%); however, 104 women (61.2%) had no additional complications. Overall, while most pregnancies were normotensive and without major complications, anaemia and selected obstetric complications were notable contributors to maternal risk.

Table 2: Antenatal and maternal complications (N=170)		
Variable	**N**	**%**
Anaemia status		
Not anaemic	80	47.1
Mild	62	36.5
Moderate	20	11.8
Severe	8	4.7
Hypertensive disorders		
Gestational hypertension	18	10.6
Severe pre-eclampsia	10	5.9
Eclampsia	4	2.4
Normotensive	138	81.1
Other antenatal complications		
Preterm labour	22	12.9
IUGR	18	10.6
GDM	10	5.9
PROM	16	9.4
No complications	104	61.2

Table 3 summarizes intrapartum and post-partum outcomes among 170 women (N = 170). The most common mode of delivery was LSCS in 82 cases (48.2%), followed by normal vaginal delivery in 72 cases (42.4%), instrumental delivery in 14 cases (8.2%), and assisted breech delivery in 2 cases (1.2%). Regarding post-partum complications, the majority had no complications (126, 74.1%). Among those affected, mastitis was the most frequent (14, 8.2%), followed by UTI (12, 7.1%), post-operative fever (10, 5.9%), and local sepsis (8, 4.7%). Overall, cesarean delivery was slightly more common, and most women had an uncomplicated post-partum course.

Table 3: Intrapartum and post-partum outcomes (N=170)		
Variable	**N**	**%**
Mode of delivery		
Normal vaginal delivery	72	42.4
LSCS	82	48.2
Instrumental delivery	14	8.2
Assisted breech	2	1.2
Post-partum complications		
Post-operative fever	10	5.9
Local sepsis	8	4.7
UTI	12	7.1
Mastitis	14	8.2
No complications	126	74.1

Table 4 presents neonatal outcomes among 170 newborns (N = 170). The most common outcome was NICU admission, required in 68 cases (40%), followed by low birth weight (<2.5 kg) in 60 cases (35.3%). Respiratory distress occurred in 30 neonates (17.6%), and prematurity was noted in 24 cases (14.1%). Adverse outcomes were less frequent for stillbirth (4 cases, 2.4%) and early neonatal death (2 cases, 1.2%). Overall, while most neonates survived, a considerable proportion required intensive care support.

Table 4: Neonatal outcomes (N=170)		
Neonatal outcome	**N**	**%**
Low birth weight (<2.5 kg)	60	35.3
Prematurity	24	14.1
Respiratory distress	30	17.6
NICU admission	68	40
Stillbirth	4	2.4
Early neonatal death	2	1.2

Discussion

The current research examined 170 teenage mothers and showed that most of them (64.73) were aged 18-19 years, and few (7.13) teenage mothers were aged 13-15 years. This is similar to the data of Bhalerao et al., (1990) [8] who showed a majority of teenage pregnancies fell in the late adolescent group (1719 years) with over 90 percent of the cases being in this bracket. Likewise, researchers in work by Verma and Das (1997) [9] and Shravage JC (2000) [10] had found the prevalence of older adolescents, though biological maturity may not necessarily exclude the risk of obstetric. However, by contrast, some previous Indian hospital-based data indicated a relatively higher rate of very young teenagers (<16 years), more severely complicated (Bhaduria et al., 1991) [11] which suggests that the progression of the adolescent age can reduce but not eliminate negative diseases."

Socioeconomically, half (50.6) of our participants were in the lower middle-class and the other half (30.6) were in lower class with almost half (44.7) having only secondary level education. This is in line with Guttmacher Institute evidence which found that years of female education were strongly associated with reducing the rate of teenage pregnancy, by 34 and 54 per cent in urban and rural areas respectively (Marimuthu and Sivamanju, 2022) [12] respectively. Similar reports on the low education attainment and teen pregnancy were reported by Pal et al. (1997) [13] who reported that adolescent pregnancy was more prevalent among the socioeconomically disadvantaged groups. In such a way, our results support the social factors of teenage pregnancy and pregnancy outcomes.

Anaemia was detected in 52.9 percent of our teen mothers (mild 36.5%, moderate 11.8, severe 4.7) which is comparatively close to the prevalence among women of reproductive age (approximately 53 percent) noted in big surveys (CDC, 1998) [14] . Other studies (Verma and Das 9; Shravage 10) have also reported greater rates of anaemia in teenage primigravidae than in women aged 20-29 years, which is explained by the fact that the former have inadequate nutritional reserves and have to meet maternal growth requirements. We have thus anaemia rates that are in line with previous Indian data, albeit some regional surveys have indicated even higher rates of above 60% particularly among the rural adolescents (Pal et al., 1997) [13]. Continuous anaemia was probably one of the factors that resulted in the high rates of preterm births and low birth weight in our cohort.

Hypertensive conditions were found in 18.9 percent (gestational hypertension 10.6, severe pre-eclampsia 5.9, eclampsia 2.4). It is similar to 20 percent of

incidence of teen pregnancies reported by Padte et al. (1989). A high probability of pre-eclampsia in teenage mothers, compared to adult controls was also detected by Verma and Das (1997) [9] and Bhaduria et al. (1991) [11]. The risk of pre-eclampsia was almost three times more in adolescents which was similar to what we found with hypertensive morbidity. Nevertheless, other reports in international settings have reported comparable or even less rates in the case of sufficient antenatal care where the access to untimed care may overturn the vulnerability of biology.

In our cases preterm labour was recorded in 12.9% that was very close to 12.83 percent by Padte et al. (1989) [15] and a bit lower than 16 percent by Bhalerao et al. (1990) [8]. Yet Shravage (2000) [10] reported up to 32 percent rates in the case of primigravidae of teenagers and showed that there is very high variation. These differences could indicate differences in nutritional status, antenatal monitoring and patterns of referrals. Interference with the normal growth of the fetus (10.6) and the premature burst of the membranes (9.4) were also conspicuous in our research, which aligns with the work of Dutta and Joshi (2013) [16], who characterize that the fetal growth restrictions among teenagers are higher.

With regard to mode of delivery, 48.2 percent of our participants were lower segment caesarean section (LSCS), and this is compared to 31 percent according to Shravage (2000) [10] and 27.3 percent according to Chahande (2000). The same was reported by Pal et al. (1997) [13] who cited higher rates of operative delivery in adolescents, mostly due to the cephalopelvic disproportion and fetus distress. Our LSCS rate, where fetal distress was the most frequent sign and CPD was the second, is slightly different with Shravage (2000) [10], who reported CPD to be the most frequent cause. The high caesarean section rate in our cohort could have been a result of careful obstetric practice and better accessibility of these institutions and could be more biological immaturity than biological immaturity.

The incidence of postpartum complications in our study was not very high (25.9 percent), but the most frequent were urinary tract infection (7.1 percent) and mastitis (8.2 percent). Previous research has indicated the increase in the postpartum morbidity, especially the sepsis and the post-partum haemorrhage (Bhaduria et al., 1991) [11]. It is important to note that we did not observe any maternal mortality unlike older literature that indicated that there was more maternal mortality among adolescents (Pal et al., 1997) [13]. Better emergency obstetric care can be the reason of this positive outcome.

Neonatal findings showed low birth weight (LBW), prematurity and respiratory distress were 35.3, 14.1 and 17.6 respectively, and 40% of institutions admitted them to the NICU. These results can be compared with those of Kumar A (2007) [17] who found out that teenage mothers had a higher rate of perinatal asphyxia (11.7%), jaundice (5.77%), and respiratory distress (1.9%). Our respiratory distress rate is higher although this could possibly be the result of looser NICU admission requirements. Higher incidence of LBW among teenage pregnancies was also reported by Dutta and Joshi (2013) [16] and Shravage (2000) [10], which is always greater than 30%. The case rates of stillbirth (2.4) and early neonatal death (1.2) in our study are comparable to previous Indian hospital-based reports but lower than cases reported in the 1990s (Bhalerao et al., 1990) [8], which implies that there is an improvement in the care provided to a newborn.

In general, our results are consistent with the current literature in India proving high rates of maternal anaemia, hypertensive diseases, births through surgery, and poor neonatal outcomes in teenage mothers. Nonetheless, the decreased maternal mortality and the postpartum morbidity that is manageable in our research implies the improvement of obstetric and neonatal services. High LBW and NICU admission rates have persisted due to the effects of biological immaturity which has been aggravated by socio-economic disadvantage resulting in teenage pregnancy as a major issue of concern in the context of public health being supported once again.

Conclusion

The present study on teenage pregnancy outcomes and determinants demonstrates that most adolescent mothers belonged to late adolescence, predominantly from lower and lower-middle socio-economic backgrounds, with education largely limited to secondary level. A considerable proportion experienced antenatal complications, particularly anaemia and hypertensive disorders, along with conditions such as preterm labour, intrauterine growth restriction, gestational diabetes, and premature rupture of membranes. Nearly half of the deliveries were conducted by caesarean section, indicating a substantial need for operative intervention, while a smaller proportion required instrumental or assisted deliveries. Although the majority did not develop post-partum complications, infections and febrile morbidity were notable among some mothers. Neonatal outcomes revealed a significant burden of low birth weight, prematurity, respiratory distress, and a high rate of intensive care admissions, with a small number of stillbirths and early neonatal deaths. Overall, teenage pregnancy was associated with increased maternal and neonatal risks, highlighting the need for improved adolescent reproductive health education, timely antenatal care,

and targeted interventions to reduce adverse outcomes.

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