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TEENAGE PREGNANCY: RISK ANALYSIS in a tertiary care hospital

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ABSTRACT

Background: In India, teenage pregnancy is an important health issue and most teenage mothers are married, though the national policy of the Government of India advocates the minimum legal age of marriage for girls to be 18 yrs. It is a common problem in India that is more likely to affect vulnerable populations due to factors including poverty, illiteracy, and a lack of job prospects. It continues to be a significant factor in maternal and infant mortality and morbidity, as well as inter-generational cycles of illness and poverty.
Objective: To find out association between feto-maternal complications and teenage pregnancy.
Methods: One prospective cohort study was conducted in Kolkata, West Bengal. Total 504 mothers were divided in teenage (<20 years) and adult (age 20-24years) groups. Feto-maternal outcomes of the two groups were analyzed.
Results: Total 201 teenage mothers (age<20 years) and 303 non-teenage mothers (age 20-24 years) were studied during the study period fulfilling the inclusion and exclusion criterias. This study found an increased risk of many adverse fetomaternal outcomes like anaemia (RR : 1.1697),UTI(2.5627), gestational hypertension (RR: 2.5124), preeclampsia (RR: 4.5224), STDs (RR: 9.0448), Instrumental Vaginal Delivery (RR:2.2612) and SNCU admission (RR: 1.9785) among teenage mothers compared to non-teenage /adult mothers.
Conclusion: Overall, this study contributes critical insights into the complex health implications of teenage pregnancy, emphasizing the urgent need for targeted interventions and comprehensive healthcare strategies to improve maternal and foetal outcomes in this vulnerable population.

Keywords*: Anaemia, UTI, gestational hypertension, preeclampsia, STDs, Instrumental Vaginal Delivery, SNCU admission.*

INTRODUCTION

Teenage pregnancy is a pregnancy that occurs for a woman under the age of 20. The adolescent years are the period of rapid growth and development for a girl child. A Teenage girl is very vulnerable both physically and mentally during the adolescent period and tteenage pregnancy results in many adverse outcomes in their later life as a mother as well as their children. In India, social and cultural factors influence the age of marriage for a girl leading to teenage pregnancy. Teenage mothers facing higher risks of complications during pregnancy and childbirth compared to older women. Teenage pregnancies are associated with an increased risk of preterm delivery, low birth weight, preeclampsia, and other maternal health issues. Additionally, the new-borns of teenage mothers are more likely to experience poor neonatal outcomes, including higher rates of neonatal morbidity and mortality.

Teenagers often lack the physical, emotional, and social support needed to cope with pregnancy, which may contribute to these adverse outcomes. Despite the growing recognition of these risks, there is a limited understanding of the specific outcomes of teenage pregnancy in different populations. This study aims to evaluate the maternal and neonatal outcomes in teenage pregnancies and compare them to those of older pregnant women. The findings will help highlight the need for targeted interventions and support systems for teenage mothers.

Along with adverse health impacts, adolescent pregnancy has a permanent effect on the financial, social life, and education of a teenager preventing her from achieving the full potential in her life. It is a social problem distributed worldwide. In recent decades teenage pregnancy has become an important health issue in a great number of countries, both developed and developing.

MATERIALS AND METHODS

Study area: Department of Obstetrics and Gynaecology, Calcutta National Medical College and Hospital, Kolkata.
Study design: Hospital-based prospective cohort study.
Study period: One and a half years (from September 2022 to march 2024)
Sample size: 504 mothers fulfilling inclusion and exclusion criteria within study period were studied following method of convenience.
Selection of study population: All pregnant mothers attending the Antenatal clinic and subsequently delivering in Department of Obstetrics and Gynaecology of Calcutta National Medical College & Hospital, Kolkata.

Inclusion Criteria:
All mothers with singleton pregnancy attending OPD and admitted for delivery in a particular day.
Exclusion Criteria:

1. Mothers with age above 24 years of age or unable to continue pregnancy due to medical, social or other causes.
2. Mothers refused to give consent for this study and who didn't want to have follow up in our hospital.

Parameters to be studied:

History of patient – Age, Height, Weight, Gravida, Parity, socioeconomic status, marital status, LMP, EDD, Gestational age,
General Physical Examination and thorough obstetrics examination

Maternal complications

Anaemia, UTI, Placenta previa, Hypertensive disorders of pregnancy, Postpartum haemorrhage (PPH), APH, Obs. Cholestasis, Cephalo-pelvic disproportion (CPD), PROM, PPROM, GDM, Abortion, Pre-term labor, Puerperal depression and psychosis and STDs.

Mode of Delivery- Vaginal Delivery, Instrumental Vaginal Delivery, LSCS.
Foetal Complications-Still Birth, LBW, VLBW, ELBW, Birth asphyxia, IUFD, Prematurity, SNCU admission.

Method of data collection: All mothers who fulfil the inclusion criteria in one particular day was studied and investigations were noted and divided into two groups i.e., tteenage pregnancies (age<20 years) and non teenage/adult pregnancies (age 20-24 years).
Data collection was done in predesigned format. Follow-up of maternal and foetal outcomes was done. The same was repeated on several days (recorded for complete 24 hour in a particular day) during the study period.

Statistical Methods
Categorical variables are expressed as Number of patients and percentage of patients and compared across the groups using Pearson's Chi Square test for Independence of Attributes/ Fisher's Exact Test as appropriate.
Continuous variables are expressed as Mean, Median and Standard Deviation and compared across the groups using Mann-Whitney U test since the data does not follow normal distribution.
Odds Ratio and 95% Confidence Interval of Odds Ratio are calculated, wherever applicable, using Binary Logistic Regression.
Relative Risk and 95% Confidence Interval of Relative Risk are calculated wherever applicable.
The statistical software SPSS version 25 has been used for the analysis.
An alpha level of 5% has been taken, i.e. if any p value is less than 0.05 it has been considered as significant

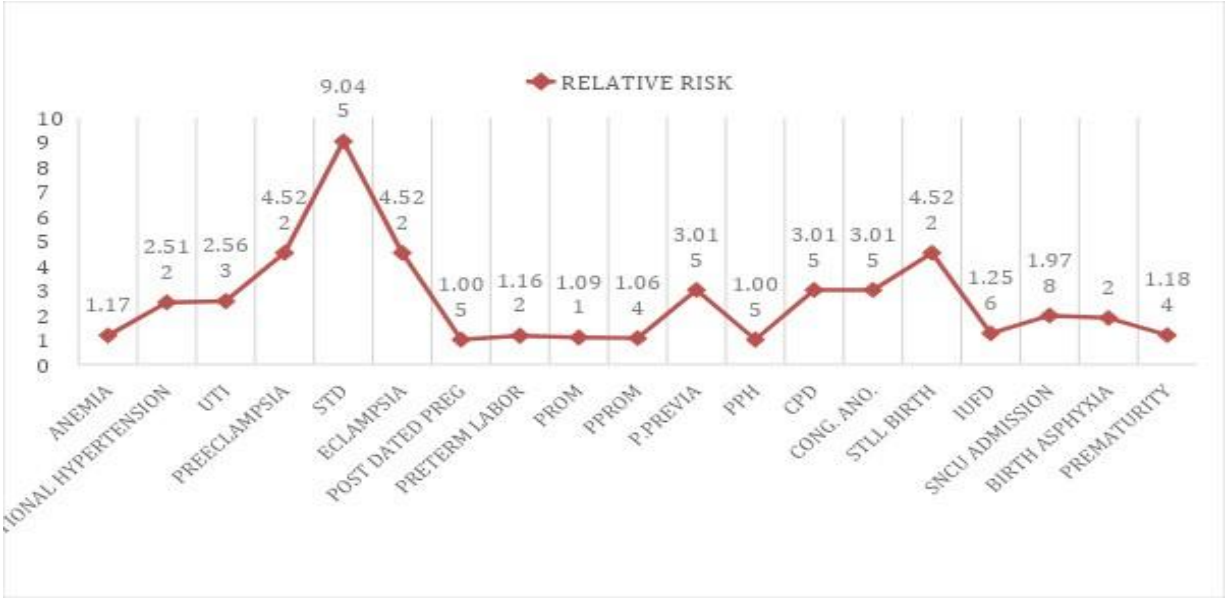
RESULTS

Total 201 teenage mothers (age<20 years) and 303 non-teenage mothers (age 20-24 years) were studied during the study period fulfilling the inclusion and exclusion criteria s.
This study found an increased risk of many adverse fetomaternal outcomes like anaemia (RR : 1.1697),UTI(2.5627), gestational hypertension (RR: 2.5124), preeclampsia (RR: 4.5224), eclampsia (RR: 4.5224), STDs (RR: 9.0448), postdated pregnancy (RR: 1.0052), preterm labor (1.1620), PROM (RR: 1.0905), PPROM (1.0641), placenta previa (RR: 3.0149),Instrumental Vaginal Delivery(RR:2.2612), PPH (RR: 1.0050), CPD (RR:3.0149), congenital anomaly (RR: 3.0149), stillbirth (RR: 4.5224), IUFD (RR:1.2562), birth asphyxia (1.8843), prematurity (RR: 1.1844) and SNCU admission (RR: 1.9785) among teenage mothers compared to non-teenage mothers/adult pregnancies.

Findings of this study with statistical analysis are summerised in the below table.Also staistically significant fidings are highlighted in the table.

Table no 1: Relative Risk and Odds Ratio of Outcomes

OUTCOMES	Relative Risk	95% CI for Relative Risk		Odds Ratio	95% CI for Odds Ratio		P value
		Lower	Upper		Lower	Upper	
ANEMIA	**1.1697**	1.0297	1.3288	**1.5782**	1.0782	2.3101	**0.01854159**
GDM	0.6030	0.1917	1.8963	0.5949	0.1840	1.9236	0.38077490
UTI	**2.5627**	1.1979	5.4824	**2.7071**	1.2132	6.0402	**0.01180873**
GESTATIONAL HYPERTENSION	**2.5124**	1.3586	4.6462	**2.7273**	1.3997	5.3140	**0.00232764**
PREECLAMPSIA	**4.5224**	1.4793	13.8255	**4.7460**	1.5085	14.9316	**0.00355072**
Eclampsia	**4.5224**	0.4737	43.1732	4.5758	0.4726	44.3038	0.14981891
OBS. CHOLESTASIS	0.5025	0.0526	4.7970	0.5000	0.0516	4.8410	0.54170143
Post dated Pregnancy	**1.0052**	0.7423	1.5000	1.0698	0.6875	1.6646	0.76478984
Preterm Labor	**1.1620**	0.7868	1.7162	1.1986	0.7479	1.9206	0.45119623
PROM	**1.0905**	0.7283	1.6328	1.1089	0.6845	1.7965	0.67434409
PPROM	**1.0641**	0.5194	2.1799	1.0682	0.4988	2.2874	0.86521153
Hypothyroidism	0.6388	0.4145	0.9843	0.5874	0.3541	0.9747	0.03800292
Placenta Previa	**3.0149**	0.2752	33.0309	3.0352	0.2734	33.6977	0.34194791
PPH	**1.0050**	0.1694	5.9613	1.0050	0.16664	6.0690	0.99564067
ABORTION	**2.0100**	0.8628	4.6823	2.0741	0.8574	5.0173	0.09889063
CPD	**3.0149**	0.7627	11.9173	3.0769	0.7606	12.4477	0.09773107
STD	**9.0448**	2.0460	39.9851	**9.5556**	2.1152	43.1684	**0.00038230**
NVD	**1.0820**	0.9249	1.2658	1.1963	0.8347	1.7147	0.32887252
Instrumental vaginal Delivery	**2.2612**	1.0365	4.9330	**2.3629**	1.0397	5.3703	**0.03508748**
LSCS	**0.8001**	0.635	1.088	0.696	0.481	1.007	0.05378201
Congenital anomaly	**3.0149**	0.7627	11.9173	3.0769	0.7606	12.4477	0.09773107
Still Birth	**4.5224**	0.4737	43.1732	4.5758	0.4726	44.3038	0.14981891
IUFD	**1.2562**	0.3886	4.0612	1.2628	0.3802	4.1945	0.70267579
Birth asphyxia	**1.8843**	0.9010	3.9410	1.9556	0.8955	4.2708	0.08730257
Prematurity	**1.1844**	0.7785	1.8020	1.2207	0.7438	2.0034	0.42974216
SNCU Admission	**1.9785**	1.2949	3.0232	**2.2370**	2.357	3.6877	**0.00132846**
LBW	**1.1518**	0.8876	1.4945	**1.2294**	0.8384	1.8026	0.28998267



DISCUSSION

In India, despite the legal marriage age of 18 years for females, early marriage remains prevalent, leading to early sexual activity and childbearing. This study, like Mukhopadhyay et al[6], found all pregnant teenage women married, with none under 15 years and a mean age of 17.80 years among teenage mothers compared to 21.90 years among non-teenage mothers. In contrast Diabelkova J et al[14], reported 88.5 % of unmarried teenage mothers and 34.1% of unmarried non teenage mother in their study.

Most participants were Muslim, predominantly from rural areas (95.02% vs. 98.68% for teenage vs. non-teenage groups) and from low socioeconomic backgrounds. The teenage group had a significantly higher proportion of primigravida (86.57%) compared to the non-teenage group (51.49%).

Regarding delivery outcomes, vaginal births were more common among teenage mothers (58.21%) possibly due to higher rates of low-birth-weight infants though instrumental vaginal delivery (RR-2.2612, Odds Ratio-2.3629) were significantly higher in this study. This aligns partly with findings from Mukhopadhyay et al[6], Wagan et al[7], and Sahithi et al[2] and partly with studies by Chaitra Ramachandra et al[10]. and Borah et al[5] having increased operative interventions and caesarean sections in teenage pregnancies.

The primary maternal complications observed in our study included anaemia (P value <0.05)), gestational hypertension (P value < 0.05)), preeclampsia (P value <0.05)), preterm labor (P value < 0.05), UTIs (P value <0.05), and STDs (P value <0.05)) Instrumental Vaginal Delivery (P value <0.05)) SNCU Admission (P value <0.05). Anaemia affected 70.64% of teenage mothers, consistent with previous studies by Borah et al[5], Sharma et al, and Khaniya et al[13], while Saneesh et al[9] noted higher incidences in non-teenage mothers. In present study mild, moderate, and severe anaemia rates were notably higher among teenage mothers compared to their older counterparts.

Gestational diabetes mellitus (GDM) was more prevalent among non-teenage mothers (3.3%), whereas gestational hypertension (12.44%), preeclampsia (5.97%), and eclampsia (1.49%) were more common in teenage pregnancies. These findings are supported by Sahithi et al[2], Pathak et al[12], and other studies, with contrasting results from Suvi et al[15] and Zhang et al[3].

Obstetric cholestasis was more prevalent in non-teenage pregnancies (0.99%), while post-dated pregnancy rates were comparable between groups (20.95% vs.9.8% for teenage vs. non-teenage groups), similar to the study done by Seneesh et al[9]. Teenage pregnancies exhibited higher incidences of preterm labor, premature rupture of membranes (PROM), and preterm premature rupture of membranes (PPROM), consistent with previous research[4,5,6,8].

Hypothyroidism incidence was higher in non-teenage pregnancies (19.47%in non-teenage vs 12.44% in teenage mothers, both RR and Odds Ratio<1, p value<.05) in our study, contrasting with findings on placenta previa and postpartum haemorrhage (PPH), which showed similar incidences across groups. Abortions were more frequent among teenage pregnancies, while congenital anomalies and sexually transmitted diseases (STDs) were significantly higher in teenage mothers (5.97% vs. 0.66%).

In terms of fetal outcomes, teenage pregnancies demonstrated higher rates of low birth weight (LBW) infants, very low birth weight (VLBW), extremely low birth weight (ELBW), and birth asphyxia compared to non-teenage pregnancies. These findings are consistent with studies by Khaniya et al[13] and Suvi et al[15], highlighting increased NICU admissions among infants born to teenage mothers.

Teenagers should be educated about the negative consequences of teenage pregnancy, especially by their parents and at school. Building adolescents' knowledge, skills, resilience, and aspirations through relationships and education helps them delay sexual activity until they are ready; enjoy healthy, consensual relationships; and use family planning methods. Schools may play a role by encouraging students to make mature decisions about their sex and by disseminating the knowledge needed to prevent adolescent pregnancy.

Overall, this study contributes to understanding the complex maternal and foetal health challenges associated with teenage pregnancies in India, emphasizing the need for targeted interventions and comprehensive healthcare strategies for adolescent mothers.

SUMMARY

This study explores the multifaceted outcomes associated with teenage pregnancy in India, despite legal guidelines stipulating an age of 18 years for marriage among females. The study focused on married pregnant women, revealing a mean age of 17.80 years for teenage mothers and 21.90 years for non-teenage mothers. Predominantly Muslim and from rural areas with low socioeconomic status, participants were predominantly primigravida in the teenage group.

Maternal outcomes highlighted significant health challenges, including high incidences of anaemia, gestational hypertension, preeclampsia, and infections such as UTIs and STDs among teenage mothers. Anaemia, affecting 70.64% of teenage mothers and more frequent compared to non-teenage mothers. Conversely, non-teenage mothers showed higher rates of gestational diabetes mellitus (GDM) and hypothyroidism. Obstetric cholestasis was more prevalent in non-teenage pregnancies, while post-dated pregnancies were comparable between groups.

Delivery outcomes indicated a higher incidence of vaginal births among teenage mothers, possibly due to elevated rates of low-birth-weight infants. Conversely, non-teenage pregnancies often necessitated operative interventions, including caesarean sections.

Foetal outcomes underscored the vulnerability of infants born to teenage mothers, with higher rates of low birth weight, very low birth weight, extremely low birth weight, and birth asphyxia compared to infants born to older mothers. SNCU admissions were also more frequent among new-borns from teenage pregnancies.

CONCLUSION

Pregnancies in teenage should be considered high-risk pregnancies. It is necessary to emphasize the need for comprehensive prenatal care for pregnant adolescent children because insufficient prenatal care can be harmful to both the mother and her foetus. Promoting early and thorough prenatal care is a key strategy if adolescent pregnancy outcomes are to be improved.

LIMITAIONS OF THE STUDY

●It is a single centre hospital-based study hence the participants were from a specific area and locality only.
●This study cannot adequately control some factors like infection exposure and drug use, which may differ in both the group.
●The study period was short. Further long-term studies can be done to attain more reproducible data.

STRENGTH OF THE STUDY

● This study has been done in the area where prevalence of teenage pregnancy was much higher which was 20% (Although in the state West Bengal the overall prevalence is high as 16.4%).
● Being prospective, our study allows collection of data over time, which helps to establish temporal relationship between exposure (teenage pregnancy) and outcomes (fetomaternal complications)
● A relatively large sample size of 504 participants for a single center study which increase statistical power and generalizability of findings within the hospital.
● Detailed collection of data on maternal demographics, history, prenatal care and fetal outcomes allows for comprehensive analysis for adjustment for potential confounding factors, thereby enhancing the validity of the study results.

DECLARATION:

Conflicts of interests: The authors declare no conflicts of interest.
Author contribution: All authors have contributed in the manuscript.
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ABBREVIATIONS

LSCS- Lower Segment Caesarean Section,NVD-Normal Vaginal Delivery,IVD-Instrumental Vaginal Delivery,HDP - Hypertensive disorders of pregnancy,GDM - Gestational Diabetes Melitus,UTI- Urinary Tract Infections,PROM - Prerupture of membrane,PPROM - Preterm pre-rupture of membrane,PPH - Post Partum Haemorrhage,APH - Antepartum Haemorrhage,CPD - Cephalopelvic Disproportion,IUFD- Intrauterine Foetal Death,LBW- Low Birth Weight,VLBW- Very Low Birth Weight,ELBW- Extremely Low Birth weight,STD- Sexually Transmitted Diseases,OBS. CHOLESTASIS - Obstetric cholestasis.