ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

Obstetric outcomes of teenage pregnancies: A record-based study in a rural hospital of North 24 Parganas district, West Bengal

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Submission: 23-11-2023 Revision: 27-02-2024 Publication: 01-04-2024

ABSTRACT

Background: Teenage pregnancy is a pregnancy in a woman within 10–19 years of age groups. It results from a number of factors such as early age at marriage, illiteracy, poverty, premarital sex, lack of awareness, and access to contraception. Teenage pregnancy imposes serious social and medical implications relating to both maternal and child health. It is a worldwide public health problem in both developed and developing countries. **Aims and Objectives:** The study was conducted in a rural hospital of North 24 Parganas in West Bengal. The primary objective was to compare different maternal and perinatal outcomes of teenage primigravida mothers with those of adult primigravida mothers. The secondary objective was to assess the association between various sociodemographic factors on the prevalence of teenage pregnancy. **Materials and Methods:** The cross-sectional hospital record-based study includes a sample of 78 study subjects each in cases and comparison group. Records were taken from June 2019 to December 2019. **Results:** Of a total of 379 labor room admissions during the study period, 86 (22.69%) were of the teenage group and 8 cases were excluded from the study. A total of 78 teenage pregnancies were analyzed and compared with 78 adult pregnancies. The mean (standard deviation) age of teenage in our study was 18.10 ± 0.63 and that of the comparison group was 22.74 ± 1.68 years. Results revealed that teenage mothers had a statistically higher proportion of anemia (OR = 2.30, P = 0.05) and low-birth-weight babies (OR: 3.6, P = 0.05) compared to adult-primigravida mothers, respectively. **Conclusion:** Teenage pregnancy is still a rampant and important public health problem in India with unfavorable perinatal outcomes and needs to be tackled on a priority basis.

Key words: Cross-sectional studies; Obstetric outcomes; Pregnancy; Rural; Teenage

Access this article online

Website: http://nepjol.info/index.php/AJMS

DOI: 10.3126/ajms.v15i4.60135

E-ISSN: 2091-0576

P-ISSN: 2467-9100

INTRODUCTION

Women at both extreme ends of the reproductive age have unique obstetric outcomes to be considered. The adolescent period is a transitional phase of physical and mental development as well as biological, social, and psychological changes. Pregnancy during this period is not the optimal period of reproduction. These pregnancies are usually unplanned and are associated with adverse maternal and perinatal outcomes. Teenage pregnancy is a pregnancy in a woman of age group 10–19 years.[1] It is a worldwide public health problem in both developed and developing countries. It results from a number of factors: Early age at marriage, illiteracy, poverty, premarital sex, lack of awareness, and access to contraception. The incidence of teenage pregnancy varies by country. About a tenth of 130 million birth per year globally are due to teenage pregnancy and 90% of these are occurring in developing countries.[2] Sub-Saharan Africa has the highest teenage pregnancy rate with the incidence of 143/1000 girls aged 15–19 years[3] In South Asia, teenage pregnancy is highest in Bangladesh – 35% followed by Nepal – 21% and India – 21%.[4] In India, the total fertility rate was 2.3% in 2016, and the fertility rate per 1000 women in the age

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group 15–19 years was 88 in 2016 (urban-66, rural-125).[5] Rapid population growth, low-socioeconomic status, poverty, and illiteracy are mainly responsible for early marriage and childbearing, thus increasing the adolescent pregnancies. Several studies have found an increased incidence of anemia, preterm labor and prematurity, low birth weight (LBW), and an increased incidence of operative deliveries among teenagers.[6-8] 29% of the LBW was found in the age group of 15–19 years.[9] Pregnant teenagers are at higher risk than their older counterparts. Contradictorily, some studies have found favorable obstetric outcomes in teenage pregnancy. There is no or little difference in the obstetric complication in teenage pregnancy compared to the adult group if they get equal access to the antenatal care service.[10] The lower incidence in industrialized regions is due to high levels of awareness, availability, and utilization of contraception. The observed regional difference is not due to variation in sexual behavior, biological, or racial reasons.[1] It occurs in every society but the incidence and the acceptability are influenced by existing cultural and religious practices.[1] There is a significant relationship between teen's pregnancy and parental socioeconomic status.[11,12] Other influencing factors at the individual level are marital status, educational level, age of sexual debut, and living location.[13] Available scientific data suggest that pregnancy before the age of 20 years is prone to adverse obstetric outcomes. International data have profusely shown complications of pregnancy and childbirth to be the leading cause of death among teenage girls. The teenagers are assumed more prone to cephalopelvic disproportion (CPD) and obstructed labor with consequent increased cesarean births due to their immature and developing bony pelvis and genital system.[1] The outcome of teenage pregnancy and childbirth remains controversial despite the plethora of scholarly scientific literature. The conflicting evidence stimulated the interest in this study. As a leading cause of mortality, among teenage girls and a serious social problem to the society, it was hoped that the contribution of data to the pool of the evidence on teenage pregnancy would assist in designing and promoting adolescent health programs to reduce its incidence and prevent the complications.

Aims and objectives

The study was conducted in a rural hospital of North 24 Parganas in West Bengal. The primary objective was to compare different maternal and perinatal outcomes of teenage primigravida mothers with those of adult primigravida mothers. The secondary objective was to assess the association between various sociodemographic factors on the prevalence of teenage pregnancy.

MATERIALS AND METHODS

The study undertaken was a cross-sectional, observational hospital record-based study conducted on teenage primiparous women while comparing them with adult primiparous women admitted in Amdanga Rural Hospital, North 24 Pargana, West Bengal. Records were taken from June 2019 to December 2019. Teenage pregnancy younger than 13 years, multiparous teenage pregnancy, multiparous pregnancy aged 20–24 years, both groups with pre-existing medical diseases (heart diseases, diabetes, chronic hypertension, and renal diseases), and twin pregnancies were excluded from this study. Nulliparous women aged 35 years and above were excluded from the study. The main outcome measures were maternal and perinatal complications. Maternal outcome variables were the type of delivery (normal vaginal delivery [NVD] with episiotomy, NVD with tear, instrumental, C-section), pre-eclampsia/eclampsia, oligohydramnios, CPD, and obstetric hemorrhage (antepartum and post-partum hemorrhage [PPH]). Perinatal outcome measures were LBW, intrauterine growth restriction (IUGR), outcome of delivery (live birth, intrauterine fetal death [IUFD], early neonatal death, and neonatal intensive care unit [NICU] admission). There were a total of 479 labor room admissions during the time period, of which 86 were of the teenage group. A total of 78 teenage pregnancies were eligible after the exclusion. All of these 78 teenage pregnancies were included in the study. Taking a 1:1 comparison, a similar number of eligible adult primiparous pregnancies was selected through simple random sampling from the same record. The obstetric outcome was compared in both groups. Medical details of the patients during the study period were retrospectively collected from the hospital labor ward register with the assistance of the medical records unit staff after obtaining permission from BMOH. Database on their sociodemographic characteristics, prenatal, labor and delivery details, pregnancy outcomes, and immediate post-partum was also obtained from the respective ANM and ASHA registers. Data entry was done in Microsoft Office Excel. Statistical analysis was conducted using SPSS version 17.0 software. The data were summarized in terms of frequency (percentage), mean (standard deviation [SD]), and odds ratio. The obstetric outcome was compared using the student's t-test and binary logistic regression. $P<0.05$ was considered to indicate statistical significance. Ethical approval from the institutional ethics committee of RG Kar Medical College was taken. Data confidentiality were maintained throughout the study.

RESULTS

There was a total of 379 labor room admissions during the study period, of which 86 (22.69%) were of the teenage group. Out of 86 teenage pregnancies, 8 were excluded from the study. A total of 78 teenage pregnancies were analyzed and compared with 78 adult pregnancies. The mean (SD) age of teenagers in our study was 18.10±0.63 and that of the comparison group was 22.74±1.68 years and the difference of mean age was statistically significance. Binomial logistic regression analysis was done to ascertain

the effects of various sociodemographic variables associated with teenage pregnancy. The omnibus test of model fitness was statistically significant (χ^2[6]=31.19, P<0.005). The model explained 24.2% (Nagelkerke R^2) of the variance in teenage pregnancy and correctly classified 65% of cases. From Table 1, participants from the teenage pregnancy group were twice more likely to attain up to the below-secondary level of education (OR: 2.7, P<0.001), at the time of their first childbirth. The teenage mothers were more likely to belong to the below-poverty line socioeconomic category in comparison to the adult primi mother group (OR: 1.86, P<0.108) although the difference was not statistically significant. Other sociodemographic variables such as caste and religion showed no statistically significant differences.

According to Table 2, the teenage mother group comparatively had an increased prevalence of anemia (53.5% vs. 46.5%, OR=2.30, P=0.05) and the difference was statistically significant. Teenage mothers were more prone to develop oligohydramnios (OR=1.7, P=0.47), antepartum hemorrhage (APH) (OR: 1.07, P=0.99), CPD (OR: 2.60, P=0.26), and post-partum hemorrhage (OR: 2.05, P=0.41) although these findings were not statistically significant. On the contrary, pregnancy-induced hypertension (PIH) and pre-eclampsia were lower in teenage mothers (25% vs. 75%, OR: 0.32, P=0.33) and but it was not significant statistically. The study group had more preterm labor at the time of delivery (56.3% vs. 43.8%, OR=0.30, P=0.33) and were about 1.54 times (57.1% vs. 42.9%, OR: 1.54, P=0.20) more likely to deliver through C-section in comparison to the adult primi mother (Table 2).

Regarding perinatal outcome, intrauterine growth retardation (OR: 2.02, P=0.56), IUFD, and neonatal death (OR: 3.08, P=0.33) were higher among teenage pregnancy but it was not significant statistically (Table 3).

Babies born to teenage mothers were 3.6 times significantly higher odds to had LBW (OR: 3.6, P=0.05) in comparison to adult primi mothers. NICU admission of babies was twice higher among the teenage group than the adult primigravida group (OR: 2.08, P=0.31) but the difference had no statistical significance (Table 3).

DISCUSSION

Teenage pregnancy, where the maternal age is 19 years or less, is associated with health risks for both mother and the fetus which are sometimes life-threatening. Over the past decade, India has significantly reduced the portion of pregnancies between 15 and 19 years to half, from 16% during NFHS-3 in 2005–2006

Table 1: Comparison of teenage and adult primigravida mothers according to sociodemographic characteristics

Variables	Category	Age in years		AOR	95% confidence interval		P-value
		<19 years	>19 years		Lower	Upper	
Caste	General	29 (40.8)	42 (59.2)	1 (Reference)	-	-	-
	SC-ST	14 (51.9)	13 (48.1)	1.29	0.46	3.62	0.623
	OBC	35 (60.3)	23 (39.7)	1.18	0.47	2.98	0.727
Religion	Hindu	33 (41.8)	46 (58.2)	1 (Reference)	-	-	-
	Muslim	45 (58.4)	32 (1.6)	1.52	0.65	3.57	0.328
Educational level	<Secondary	63 (61.8)	39 (38.2)	2.79	1.23	6.33	0.014*
	Secondary and above	15 (35.7)	27 (64.3)	1 (Reference)	-	-	-
SES	BPL	55 (55.6)	44 (44.4)	1.86	0.87	3.98	0.108
	APL	23 (40.4)	34 (59.6)	1 (Reference)	-	-	-

*P<0.05 is considered as significant

Table 2: Comparison of teenage and adult primigravida mothers according to maternal outcomes

Variables	Age in years		OR	95% confidence interval		P-value
	≤19 years	>19 years		Lower	Upper	
Anemia	69 (53.5)	60 (46.5)	2.300	0.962	5.499	0.050*
Mode of delivery: NVD	45 (46.4)	52 (53.6)	-	-	-	-
Cesarean section	32 (57.1)	24 (42.9)	1.54	0.794	2.989	0.200
Assisted vaginal delivery	1 (33.3)	2 (66.7)	0.57	0.051	6.585	0.650
Pre-eclampsia	1 (25.0)	3 (75.0)	0.325	0.033	3.191	0.335
Intrauterine growth restriction	2 (66.7)	1 (33.3)	2.02	0.180	22.817	0.568
Antepartum hemorrhage	3 (100)	0 (0.0)	1.071	0.383	3.530	0.997
Oligohydramnios	5 (62.5)	3 (37.5)	1.712	0.395	7.426	0.472
Cephalo-pelvic disproportion	5 (71.4)	2 (28.6)	2.603	0.489	13.840	0.262
Post-partum hemorrhage	4 (66.7)	2 (33.3)	2.054	0.365	11.555	0.414
Retention of placenta	1 (33.3)	2 (66.7)	0.494	0.044	5.557	0.568

*P<0.05 is considered significant. NVD: Normal vaginal delivery

Table 3: Comparison of teenage and adult primigravida mothers according to perinatal outcomes

Variables	Age in years		OR	95% Confidence interval		P-value
	≤19 years	>19 years		Lower	Upper	
Live birth	75 (49.3)	77 (50.7)	-	-	-	-
IUFD and neonatal death	3 (75.0)	1 (25.0)	3.08	0.313	30.275	0.335
Preterm	9 (56.3)	7 (43.8)	1.323	0.467	3.750	0.599
Low birth weight	10 (76.9)	3 (23.1)	3.676	0.971	13.919	0.051*
NICU admission	6 (66.7)	3 (33.3)	2.083	0.502	8.646	0.312

IUFD: Intrauterine fetal death, *P<0.05 is considered significant, NICU: Neonatal intensive care unit

to 7.9% during NFHS-4 in 2015–2016.[14] Although the legal age at marriage is 18 years for females and 21 years for males in India, early marriage is common. By the age of 15 years, 26% of females are married, and by the age of 18 years, this figure rises to 54% and early marriage automatically links to early pregnancy.[1] The proportion of teenage pregnancy cases rises sharply from 15% at age 17 years to 24% among women age 18 years.[14] In developed countries, the rate of teenage pregnancy has dropped but in developing countries, teenage pregnancy is still present with a huge impact on maternal and child health. Thus, teenage pregnancy is considered a public health problem in India and needs to be tackled. According to the National Health Survey-5, West Bengal has reported 16% of teenage pregnancy.[14] The proportion of teenage pregnancy in our study was 22.4% which was more than the numbers quoted by NFHS-5 data.[4,14,15] The mean age of teenage mothers in our study was 18.10±0.63 years and that of adult-primigravida mothers was 22.74±1.68 years. A study done by Talwar and Venkatesh also observed similar results at SDM Medical College in India.[16] Another study done by Mukhopadhyay et al., at RG Kar Medical College also showed similar findings.[17] The proportion of teenage pregnancy varied among various educational levels and religions of mothers. These significant differences may be due to the higher education that leads to more health awareness among women and their families and better use of available health services. Moreover, in a society with a low literacy rate, the age-old social custom of early marriage of a girl child is likely to be followed by people. There was a significant difference in the status of anemia between the two groups in this study. Although the cause of anemia is not the young age of the teenage mother, it is mainly due to nutritional deficiencies of iron and folic acid, malaria, and hookworm infection. The teenage group showed more prevalence of anemia than the comparison group which was similar to the findings in a study by Mahavarkar et al.[8] However, it was in contrast to a study by Saxena et al., that concluded that the prevalence of anemia was high in the comparison group than the teenager.[18] Pregnancy-related complications such as pre-eclampsia, IUGR, APH, oligohydramnios, CPD, PPH, and retained placenta, both the groups had no statistically significant differences. This is similar to a study by Lao and Ho which concluded that there were no differences in the incidence of APH and pre-eclampsia.[19] However, a slightly high rate of PIH was reported in Mahavarkar et al., study.[8] Opinion regarding the mode of delivery in teenage pregnancy differs widely. Various literatures cited that there is biological immaturity of the pelvis in early age leading to CPD followed by cesarean section delivery.[9,15,20] In our study, cesarean delivery was more common in teenage mothers than adult primi mothers but the difference was not statistically significant. This finding was similar to a study by Pun and Chauhan showing no differences in the incidence of vaginal and cesarean delivery.[21] A similar view was expressed in some other studies also.[7,8,12,16] The mechanism of preterm labor among adolescent mothers is still unclear. However, one physiological reason is the immaturity of the uterine blood supply in young mothers which leads to an increase in prostaglandin production leading to preterm labor. Preterm labor was almost similar in both groups in our study. Laxmi et al. in Patan Hospital also mentioned no association between teenage pregnancy and preterm labor.[9] However, studies done by Tripathi et al., and Mukhopadhyay et al., mentioned a higher incidence of preterm delivery in the teenage group than in the comparison group.[17,22] In a multicountry study Blomberg et al.[23] done by the World Health Organization (WHO) in India, it was found that stillbirth and early neonatal death rate were significantly higher among teenage mothers. However, findings in our study on perinatal outcome in terms of live births, IUFD, neonatal death, and NICU admission do not corroborate with the WHO study probably because of the difference in the level of health-care facilities included in their studies. Our study was done in a rural hospital where advanced neonatological facilities were not available but cases were referred to the nearest tertiary care hospital. However, LBW was significantly more in teenage mothers which was similar to the findings by Mukhopadhyay et al. done in RG Kar Medical College.[17] Teenage pregnancy when compared with the adult primipara group was significantly associated with anemia as maternal complication and LBW baby as the perinatal outcome. There was no statistical significance in other obstetric outcomes. Fewer adverse outcomes among teenagers in our study could be due to quality antenatal, intranatal, and postnatal care.

Limitations of the study

The limitation of our study is as it was a record-based study of a rural health-care hospital, we could not evaluate home delivery or abortion cases which were not included in the records.

CONCLUSION

Teenage pregnancy with a prevalence of 22.4% is still a major problem in our Indian society. A higher level of education is an important deterrent to early marriage and early childbearing. In addition to health care, a dedicated adolescent educational policy aimed at promoting sex education and adolescent health care among girl children seems to be an effective measure to reduce the burden of teenage pregnancy in the developing world.

ACKNOWLEDGMENT

We expressed our words of thanks to BMOH, ANM, ASHA workers of Rural Hospital of Amdanga block for their guidance and co-operation.

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PS- Definition of intellectual content, literature survey, prepared the first draft of manuscript, implementation of the study protocol, data collection, data analysis, manuscript preparation, and submission of the article; PSa- Concept, design, manuscript preparation, editing, and manuscript revision; AS- Design of study, statistical analysis and interpretation; SKL- Review manuscript, literature survey, coordination, and manuscript revision.

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Source of Support: Nil, **Conflicts of Interest:** None declared.