

Original Research Article

MOTHERHOOD IN CHILDHOOD: A STUDY OF THE NEONATAL OUTCOME OF ADOLESCENT PREGNANCIES IN A TERTIARY CARE HOSPITAL IN TAMILNADU

M Vijay Anand¹, K Selvaraju¹, V Anurekha¹, K.S. Kumaravel², Mohamed Zubbin³

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Corresponding Author:

Dr. K.S.Kumaravel,

Email: kumaravelks10@gmail.com

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¹Assistant Professor, Department of Pediatrics, Govt Mohan Kumaramangalam Medical College, Salem, Tamilnadu, India.

²Professor, Department of Pediatrics, Govt Mohan Kumaramangalam Medical College, Salem, Tamilnadu, India.

³Junior Resident, Govt Mohan Kumaramangalam Medical College, Salem, Tamilnadu, India.

Abstract

Background: National Family Health Survey 5 (NFHS 5) survey of India reports that the adolescent pregnancies in the state of Tamilnadu had an increase to 6.3% from 5% in NFHS 4. This study aims to estimate the prevalence of adolescent pregnancies in an urban tertiary care hospital and to analyze the socio-demographic factors and the neonatal outcome associated with them. **Materials and Methods:** A cross-sectional descriptive study with pregnant adolescent women from 10 to 19 years as group 1 and primigravida adult women aged 20 to 29 years as group 2. **Result:** There were 602 mothers in each group. The mean age in adolescent mothers was 18.60 years and 23.46 years in adult mothers ($P<0.001$). In adolescent mothers, 73.25% were from rural areas and 66.27% were from lower socioeconomic classes. Maternal anemia was found in 56.31% of adolescent mothers against 14.28% in adult mothers ($P<0.001$). Other maternal morbidities like Pregnancy Induced Hypertension and Premature Rupture of Membranes were significantly more common in adolescent mothers than in adult mothers ($P<0.001$). There were no maternal deaths observed in both the groups. Intrauterine death was found in 2.5% of adolescent mothers against 0.3% in adult mothers ($P<0.001$). About 30% of neonates born to adolescent mothers were preterm ($P<0.001$) and about 27% had low birth weight ($P=0.023$). The neonates requiring hospitalizations were 23.17% in adolescent mothers against 6.37% in adult mothers ($P<0.001$). Birth asphyxia (3.24%) and prematurity (4.43%) were predominant causes of admission in neonates born to adolescent mothers. Neonatal deaths were observed in 2.21% of adolescent mothers and 0.67% of adult mothers ($P=0.027$). **Conclusion:** Adolescent pregnancies were associated with various adverse maternal and neonatal outcomes. Prematurity, low birth weight, birth asphyxia, intrauterine death, and neonatal hospitalizations were significantly higher in adolescent pregnancies than in adult pregnancies.

INTRODUCTION

Adolescence is the crucial period of transition to adulthood encompassing physical and neuro-maturational changes that are recognized as a strategic health investment.^[1] World Health Organization defines adolescent pregnancy as pregnancy occurring between 10 to 19 years of age at the time of childbirth.^[2] Marriage below 18 years is illegal in India as per the child marriage act which is in force since 1929 and was amended in 2006.

Every day 33,000 girls less than 18 years are forced into marriage according to UNFPA 2020 report.^[3]

National Family Health Survey 5 (NFHS 5) survey of India reports the number of women aged 15 to 19 years who were already mothers or pregnant at the time of the survey was 6.8%, which has improved from 7.9% in NFHS 4.^[4] However, in the state of Tamilnadu, an increase was reported from 5% in NFHS 4 to 6.3% in NFHS 5. This is despite the significant improvements in all other major health indices like Neonatal Mortality Rate (NMR), Infant Mortality Rate (IMR) and Under 5 Mortality Rates (U5MR) in the state in the NFHS 5 survey.

Reducing adolescent pregnancy in India can fasten the progress toward achieving the United Nations Sustainable Development Goals 5.3 (UNSDG) of eliminating adolescent pregnancies.^[5] The adverse outcomes of adolescent pregnancies are attributed not only to age but also because of relatively disadvantaged socioeconomic backgrounds.^[6] There are greater chances of adverse neonatal outcomes like neonatal intensive care admission. Association between adolescent pregnancy and neonatal morbidities like prematurity was well established in many Indian studies.^[7,8] This study aims to estimate the prevalence of adolescent pregnancies in an urban tertiary care hospital and to analyze the socio-demographic factors and the neonatal outcome associated with them.

MATERIALS AND METHODS

Study Design and Setting

This was a cross-sectional study, which collected the data from January'2021 to June'2021, in a tertiary care referral hospital in the south Indian state of Tamilnadu. The study hospital is a large obstetric and neonatal care center in the region with advanced facilities for the management of sick mothers and neonates. Every year about 12,000 deliveries are conducted and about 5,000 sick neonates are treated in the hospital. Institutional Human Ethics Committee approval (Ref.No:4341/2019-562) was obtained for the study. Informed written consent obtained.

Study Participants

The inclusion criteria were to include all the adolescent mothers below 19 years of age, admitted to the study hospital for delivery, who formed Group 1. On each day, equal number of deliveries of primigravida adult mothers from 20 to 29 years of age, formed Group 2. The pregnancies in unmarried women and the pregnancies in COVID19 positive mothers, who were admitted in a dedicated COVID19 facility, were excluded from both the study groups.

Data Measurement

The socio-demographic data including the mother's age, parity, socio-economic class, educational status, and domicile status were collected. The clinical data of the mother including the mode of delivery, viability of the fetus, presence of Premature Rupture of Membranes (PROM), Pregnancy Induced Hypertension (PIH), and anemia were collected from the case records. The neonatal clinical data including birth weight, Neonatal Intensive Care Unit (NICU) admission, neonatal morbidities, 1 and 5-minute APGAR scores, and outcome were recorded in the structured proforma.

Sample Size

The sample size was calculated using the below formula. $N = Z^2pq/D^2$, where Z is the Z score (which

is 1.96 for a 95% confidence interval), p is prevalence (which is 6.8% as per NFHS 5), q is 100-p (which is 93.2) and D is margin of error (which is 5% with 95% confidence interval) (6). A minimum sample size of 97.38 was calculated. But all the adolescent mothers who met the inclusion criteria during the study period were included.

Statistical Analysis

Statistical analysis was done using R software. All categorical data were presented using frequency and percentages. To study the association of clinical and demographic parameters with the neonatal outcome, an independent sample t-test or Mann-Whitney U test was applied. P-value was considered significant at a 5% level of significance for all comparisons.

RESULTS

During the study period, there were 5868 deliveries reported in the hospital, out of which 602 (10.26%) were adolescent pregnancies. The socio-demographic and clinical profile of mothers was tabulated in [Table 1]. The mean age of adolescent mothers was 18.60 years \pm 0.72 and the adult mother was 23.46 years \pm 2.70. About 73.25% of adolescent mothers and 65.61% of adult mothers were from rural areas ($P=0.004$). About 53.48% of adolescent mothers have studied up to higher secondary schooling. About 66.27% of the adolescent mothers and 56.47% of the adult mothers hail from lower socio-economic class. Maternal anemia, PIH and PROM were significantly more common in adolescent mothers than in adult mothers ($P<0.001$, <0.001 and 0.033 respectively). Significantly higher number of adolescent mothers delivered by labour naturalis (56.81%) than adult mothers (47.50%) ($P<0.001$). Intrauterine death was seen in 2.5% and there was no stillbirth in adult mothers. There were no maternal deaths observed in both the groups.

The clinical profile of neonates, after excluding intrauterine deaths and still born was tabulated in [Table 2]. About 30.15% of the neonates born to adolescent mothers were born pre-term, while among adult mothers it was 20.6% ($P<0.001$). About 27% of the neonates born to adolescent mothers had low birth weight, which was 20.5% among adult mothers ($P=0.023$). The mean birth weight was 2.59 kgs among adolescent mothers and 2.75kgs among adult mothers ($P<0.001$). The incidence of NICU admissions was 23.17% among the adolescent mothers and 6.37% in the adult mothers ($P<0.001$). On analyzing the morbidity, prematurity was observed in 4.43%, followed by respiratory distress syndrome and birth asphyxia in 3.24% each. On analyzing the outcome, significantly higher deaths were observed among the neonates born to adolescent mothers than in adult mothers ($P=0.027$).

Table 1: Socio-demographic and clinical profile of mothers.

Factors	Adolescent pregnancies (n=602)	Adult pregnancies (n=602)	P-value
Age, mean \pm SD	18.60 \pm 0.72	23.46 \pm 2.70	<0.001
Domicile status			
Rural	441 (73.25%)	395 (65.61%)	0.004
Urban	161 (26.75%)	207 (34.39%)	
Education status			
Up to primary	30 (4.98 %)	52 (8.63%)	<0.001
High school	250 (41.52%)	177 (29.40%)	
Higher Secondary	322 (53.48%)	150 (24.91%)	
Graduate & above	0	223 (37.04%)	
Socio-Economic Class			
Middle	6 (1 %)	62 (10.29%)	<0.001
Lower middle	197 (32.72%)	200 (33.22%)	
Lower	399 (66.27%)	340 (56.47%)	
Maternal diseases			
Anemia	339 (56.31%)	86 (14.28%)	<0.001
Gestational Diabetes	3 (0.5%)	6 (1 %)	
Pregnancy Induced Hypertension	26 (4.31%)	10 (1.66%)	
Thyroid disorder	1 (0.2%)	4(0.7 %)	
Premature rupture of membranes	72 (11.96%)	50 (8.30%)	0.033
Mode of delivery			
Normal delivery	342 (56.81%)	286 (47.50%)	0.001
Caesarean section	260 (43.19%)	316 (52.49%)	
Viability			
Live birth	587 (97.5%)	597 (99.2%)	0.001
Intrauterine death	15 (2.5%)	2 (0.3%)	
Stillbirth	0 (0.0%)	3 (0.5%)	

Table 2: Clinical profile of the neonates.

Factors	Adolescent pregnancies (n=587)	Adult pregnancies (n=597)	P-value
Gestational age			
<28 weeks	2 (0.34%)	4 (0.67%)	<0.001
28weeks to <34 weeks	20 (3.40%)	7 (1.17%)	
34weeks to <37weeks	155 (26.40%)	112 (18.76%)	
>37 weeks	410 (69.85%)	474(79.40%)	
Birth weight categories			
Very low birth weight	19 (3.24%)	10 (1.67%)	0.023
Low birth weight	142 (24.19%)	113 (18.92%)	
Normal	426 (72.57%)	474 (79.40%)	
Birth weight (in grams), mean \pm SD	2597.17 \pm 504.40	2755.13 \pm 458.17	<0.001
APGAR score at 1 min, mean \pm SD	6.96 \pm 0.68	6.98 \pm 0.34	0.37
APGAR score at 5 min, mean \pm SD	8.04 \pm 0.43	8.00 \pm 0.29	0.062
NICU admission			
Yes	136 (23.17%)	38 (6.37%)	<0.001
No	451 (76.83%)	559 (93.63%)	
Neonatal morbidity			
Birth asphyxia	19 (3.24%)	1 (0.17%)	0.003
Prematurity	26 (4.43%)	2 (0.34%)	
Respiratory distress syndrome	19 (3.24%)	10 (1.68%)	
Sepsis	7 (1.19%)	7 (1.17%)	
Others	65 (4.60%)	18 (2.01%)	
Outcome			
Discharged	574 (97.79%)	593 (99.33%)	0.027
Expired	13 (2.21%)	4 (0.67%)	

DISCUSSION

The prevalence of adolescent pregnancy in this study was 10.26%. A study of maternal and fetal outcome of teenage pregnancies done in the same institution in 2019, had an incidence of 9.6%.^[9] There is wide variation in the prevalence in various studies.^[10,11] About 73.25% of the adolescent mothers in the present study were from rural areas. The rural predominance of adolescent pregnancies was observed in many studies and also in NFHS

5.^[4,6,7,12] The rural population has the traditional practice of early marriage, which pushes them to pregnancy earlier. About 41.52% of the adolescent mothers had studied only up to high school. School dropping has been well established in many other studies also.^[7,8,13] For socio-cultural reasons, economically disadvantaged girls from rural areas are less likely to complete their schooling and get married at an early age.^[8,13] Anemia is more prevalent in adolescent mothers (56.31%) in the present study. A similar finding was

observed in many studies.^[7,8,10] Anemia among adolescent girls is due to an increased requirement for physical growth, maturation in reproductive functions, and cognitive transformation for the future. A significantly higher number of natural labour was observed among adolescent mothers in the present study. This may be due to the small size of the babies born to adolescent mothers when compared to adult mothers and due to the fact that the study hospital is an urban referral hospital receiving referrals which need more cesarian sections.^[7] Adolescent pregnancies resulted in 97.5% of live births and 2.5% of intrauterine deaths. In contrast, only 0.3% of intrauterine deaths were observed among neonates born to adult mothers in the present study. These findings were also found in other studies.^[7,8] There were no reported stillbirths in adolescent mothers during the study period. However, some studies have reported stillbirths in adolescent pregnancies.^[14,15]

Many studies have also reported higher preterm births that were observed in this study.^[6,7,8,10] Preterm births in adolescent women may be associated with a lower number of antenatal visits, late initiation of prenatal care, lower educational levels, maternal malnutrition, and anemia.^[16] The mean birth weight in neonates born to adolescent mothers was significantly lower in the present study. Similar findings were observed in many other studies also.^[6,7,10]

Higher NICU admissions (23.17%) were observed in adolescent pregnancies in the present study. Admission rates ranged from 26.9% to 52% in other studies.^[15,17] Higher neonatal admissions are because of neonatal morbidities. In the present study, higher neonatal mortality was observed in adolescent pregnancies. Many studies have demonstrated higher neonatal mortality among neonates born to adolescent mothers, especially in low and middle-income countries.^[18,19]

Though the state of Tamilnadu has reported improvements in health indices like NMR, IMR, and U5MR, an increase in adolescent pregnancies was a setback. This increase in adolescent pregnancies will be an important hurdle to achieve the UNSDG of reducing the NMR to below 12 per 1000 live births by the year 2030. Hence, there is an urgent need to bring in interventions to eliminate adolescent pregnancies.

This study has a few limitations. Since this is a hospital-based study, the prevalence in this study may not reflect the prevalence in the community. Further, larger studies at the community level are needed to understand the various cultural and social practices involved in adolescent marriages and pregnancies, which will help in eliminating adolescent pregnancies.

CONCLUSION

Adolescent pregnancies are associated with various adverse maternal and neonatal outcomes. This study has demonstrated that maternal anemia, prematurity, low birth weight, birth asphyxia, intrauterine death, NICU admissions, and neonatal deaths are significantly higher in adolescent pregnancies. A larger social and cultural evolution in preventing adolescent marriages and pregnancies is needed to achieve UNSDG 5.3 of eliminating adolescent pregnancies by 2030.

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