

Analyzing the Relationship between Fetal Outcome and Sociodemographic Profile in Adolescent and Adult MothersPriyanka Kumari¹, Rahul Ranjan², Krishna Sinha³¹Senior Resident, Department of Obstetrics & Gynecology, Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India²Senior Resident, Department of Surgery, Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India³Associate Professor, Department of Obstetrics & Gynecology, Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India

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Abstract**Background:** Teenage pregnancy is generally acknowledged as a multifaceted and significant social, economic, and health issue on a global scale. Adolescent pregnancy is associated with a heightened risk of complications. The outcome is less favourable compared to that of a pregnancy in the general population.**Aim & Objective:** To determine the prevalence of adolescent pregnancy, examine the maternal and foetal outcomes associated with adolescent pregnancy, and compare these outcomes to those of adult mothers aged 20-26 years.**Material and Methods:** This research is designed as a prospective case-control study. A total of 150 cases of adolescent pregnancy (ages 13-19) were compared with 150 cases of a control group (ages 20-26) in terms of the outcome for the foetus. Following randomization, the sociodemographic data were assessed using a semi-structured proforma. The research was done in a systematic way, ensuring that individuals voluntarily agreed to participate and provided informed consent.**Results:** The average age of teenage mothers was 18.25 years, whereas the average age of adult mothers was 22.78 years. Our research revealed a greater incidence of preterm birth among adolescent moms (20%) compared to mature mothers (6%). The prevalence of caesarean section deliveries was substantially higher among adolescent moms (28.67%) compared to mature mothers (15.3%). The prevalence of low birth weight was significantly greater among adolescent moms (31.33%) compared to mature mothers (14.67%). Birth asphyxia is a common complication, occurring in 11.3% of cases.**Keywords:** Teenage mother; Adult Mother; Neonatal complication; Pregnancy.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

The World Health Organisation (WHO) classifies the time from 10 to 19 years of age as adolescence, which is synonymous with the word teenage [1]. Pregnancy that occurs at this stage is referred to as adolescent pregnancy. The physical, psychological, and mental condition of a girl at this transitional time is considered insufficiently developed to handle a pregnancy.

Adolescent pregnancy is a global issue that affects both society and health, and its occurrence varies across different regions. UNICEF reports that globally, around 20% of children are born to teenage mothers [1]. Around 13 million births occur annually to females under the age of 19. The prevalence of adolescent pregnancy in India ranges from 3.2% to 18.6% [2]. The UNICEF 2011 report states that the teenage population in India accounts

for 20% of the overall population, which is equivalent to 243 million individuals [3]. The prevalence of marriage among females aged 15 to 19 years is 27%, while the birth rate for this age range is 45 per 1000 girls [3]. Although early weddings are prevalent in rural India and early maternity is celebrated in our communities, it is important to recognise that early pregnancy is linked to several health hazards for both the mother and the infant.

An adolescent mother has a heightened chance of experiencing inadequate maternal weight gain, a high maternal death rate, and complications such as toxemia of pregnancy, anaemia, sexually transmitted diseases, premature birth, and intrauterine growth retardation. The negative consequences for the foetus include premature delivery, newborns with low birth weight, foetal

demise, and birth-related oxygen deprivation [4]. The objective of this research is to determine the occurrence and assess the different obstetric and foetal outcomes associated with adolescent pregnancy.

Methods

Study Design, Location and Duration: This research is a prospective case-control study. A total of 150 cases of teenage pregnancy (ages 13-19) were compared with 150 control cases (ages 20-26) in terms of foetal outcome. These cases were admitted to the Department of Obstetrics and Gynecology at Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India during the period of 2022-2023. We enrolled all the adolescent patients who were pregnant for the first time in the research till we reached a total of 150 instances. We conducted comparative research by randomly selecting 150 instances of adult pregnancy.

Study group: Individuals aged up to 19 at the time of delivery. The control group consists of individuals aged between 20 and 26 years.

Inclusion criteria: Only singleton pregnancies were considered as inclusion criterion.

Exclusion criteria: Females beyond 26 years of age. Prior medical conditions before pregnancy, such as hypertension (HT) diabetic, cardiac, renal, endocrine or autoimmune disease. Multiple gestation

Ethical Considerations: All ethical considerations pertaining to the investigation were appropriately addressed. Prior to commencing the trial, we got clearance from the hospital's ethical committee. Each woman enrolled into the research provided informed consent. All patients were treated in accordance with the department's policy and were clinically monitored until their release.

Statistical Analysis: The chi-square and Student's t-test were used as needed. A P value below 0.05 was considered statistically significant.

Results

The average age of teenage mothers was 18.25 years, whereas adult mothers had an average age of 22.78 years. The majority of adolescent mothers (58.7%) come from a low socioeconomic position, are housewives (98.67%) by profession, have no formal education (70.7%), identify as Hindu (63.3%) by religion, live in a joint household (62.67%), and come from a rural background (71.3%). Among adult mothers, the majority (58.0%) belong to the middle socioeconomic class, work as housewives (88.67%), have completed elementary level education (45.3%), follow the Hindu faith (53.3%), live in nuclear families (52.67%), and come from urban backgrounds (56.7%). We observed a statistically significant disparity in the average age, socioeconomic position, employment, education level, family structure, and geographic location between the two groups ($p < 0.05$). However, after considering religion, both groups were shown to be statistically similar ($p\text{-value} > 0.05$) (Table 1).

Table 1: Distribution of sociodemographic profile in both group

Variables	Teenage Mother N= 150 (%)	Adult Mother N=150 (%)	X ² (df)	p value
Age in Mean (SD)	18.25 (0.948)	22.78 (2.030)	(t test) -24.787	0.000
Socioeconomic Status				
High	03 (02.0)	14 (09.3)	23.590 (2)	0.000
Middle	59 (39.3)	87 (58.0)		
Low	88 (58.7)	49 (32.7)		
Occupation				
Housewife	148 (98.67)	133 (88.67)	12.643 (1)	0.000
Working	02 (01.33)	17 (11.33)		
Education				
Illiterate	106 (70.7)	36 (24.0)	79.142 (3)	0.000
Primary	41 (27.3)	68 (45.3)		
Secondary	03 (02.0)	35 (23.3)		
Graduate	00 (0.0)	11 (07.3)		
Religion				
Hindu	95 (63.3)	80 (53.3)	3.086 (1)	0.079
Muslim	55 (36.7)	70 (46.7)		
Family				
Nuclear	56 (37.33)	79 (52.67)	7.125 (1)	0.008
Joint	94 (62.67)	71 (47.33)		
Area				
Urban	43 (28.7)	85 (56.7)	24.037 (1)	0.000
Rural	107 (71.3)	65 (43.3)		

The teenage mothers had a higher proportion (20%) of preterm deliveries as compared to the adult mothers (6%) while adult mothers had a higher proportion of post-term pregnancies (10%) as compared to the teenage mothers (1.3%). However,

most of the deliveries were term delivery in both groups. The period of gestation during delivery was statistically significant in both groups (p-value 0.00) (Table 2).

Table 2: Distribution of Cases According to Period of Gestation (weeks)

Period of Gestation(weeks)	Teenage Mothers	Adult Mother	X ² (df)	p-value
	N (%)	N (%)		
Pre-term (32-36)	30 (20.0)	09 (06.0)	21.511 (2)	0.000
Term (37-40)	118 (78.7)	126 (84.0)		
Post-term (>40)	02 (01.3)	15 (10.0)		

Vaginal delivery was the most common mode of delivery in both groups, 62% of teenage mothers and 76.7% of adult mothers delivered by vaginal rout. In teenage mothers, cesarean section (LSCS) was done in 28.67%, 6% delivered by assisted breech and

3.3% by forceps. While in adult mothers, LSCS was done in 15.3%, 7.3% delivered by assisted breech and only 0.7% delivered by forceps. Mode of delivery was significant in our study (p-value 0.01) (Table 3).

Table 3: Distribution of Cases According to Mode of Delivery

Mode of Delivery	Teenage Mothers	Adult Mother	X ² (df)	p-value
	N (%)	N (%)		
Assisted Breech	09 (06.0)	11 (07.3)	11.254 (3)	0.010
Forceps	05 (03.3)	01 (0.7)		
LSCS	43 (28.67)	23 (15.3)		
Normal Vaginal	93(62.0)	115 (76.7)		

A maximum number of babies (82.67% & 92.0%) had good Apgar Score (7-10) at 1 minute in both teenage and adult mothers respectively. While 10% of babies in teenage mother and 5.33% in adult mother had severe depression (Apgar Score 0-3) on Apgar score at 1 minute. Statistically, it was found significant (p-value 0.046). Similarly, 9.33% babies

of a teenage mother and 4.0% babies of the adult mother had also severe depression (Apgar Score 0-3) on Apgar score at 5 minutes. Most of the babies (84.0% & 93.33%) in teenage and adult mother had good Apgar Score at 5 minutes. The difference was statistically significant (p-value 0.039) (Table 4).

Table 4: Distribution of Cases According to Apgar Score at 1 and 5 Minutes

ApgarScore	1 Minute				5 Minute			
	TeenageMothers		Adult Mothers		TeenageMothers		Adult Mothers	
	No	%	No	%	No	%	No	%
0-3	15	10.0	08	05.33	14	09.33	06	04.0
4-6	11	07.33	04	02.67	10	06.67	04	02.67
7-10	124	82.67	138	92.0	126	84.0	140	93.33

A Higher proportion of neonatal morbidity was present in teenage mothers (72.67%) as compared to adult mothers (28.0%). 31.33% babies of the teenage mother had low birth weight (<2.5 kg) as compared to adult mother's babies (14.67%). Intrauterine growth retardation (IUGR) was found in 10.7% babies of the teenage mother while 2.0% babies of the adult mother were IUGR. 11.3% babies of a teenage mother and 4.7% babies of the adult mother had birth asphyxia at the time of delivery. 8.7% and 2.7% babies were affected by meconium

aspiration syndrome (MAS) in teenage and adult mother respectively. Neonatal sepsis occurred in 3.3% of babies of a teenage mother and 1.3% in babies of the adult mother. Neonatal hyperbilirubinemia was found in 5.3% and 1.3% in babies of teenage and adult mother respectively. A similar incidence of congenital anomalies (1.3%) was found in both groups. Regarding fetal and neonatal complication, the difference was found statistically significant (p-value 0.00) (Table 5).

Table 5: Distribution of Fetal and neonatal complication in both group

Variables	Teenage Mother N=150 (%)	Adult Mother N=150 (%)	X ² (df)	p-value
IUGR	16 (10.7)	03 (02.0)	62.897 (8)	0.000
Low Birth Weight (<2.5 kg)	47 (31.33)	22 (14.67)		
Birth Asphyxia	17 (11.3)	07 (04.7)		

Neonatal Sepsis	05 (03.3)	02 (01.3)		
Neonatal Hyperbilirubinemia	08 (05.3)	02 (01.3)		
MAS	13 (08.7)	04 (02.7)		
Intestinal Perforation	01 (0.7)	0 (0.0)		
Congenital Anomalies	02 (01.3)	02 (01.3)		
No Complication	41 (27.33)	108 (72.0)		

Fresh Still Birth (FSB) were 2.7% in teenage mother and 0.7% in the adult mother. While Macerated Still Birth (MSB) were 2.0% in teenage mother and 1.3% in the adult mother. Early neonatal death was found 2.0% in teenage mother's babies while 0.7% in adult

mother's babies. There was 3.3% neonatal death in teenage mothers whereas 1.3% of adult mothers. 90% of teenage mothers and 96% of adult mother delivered alive babies. It was found statistically insignificant (p-value 0.334) (Table 6).

Table 6: Distribution of Fetal and neonatal mortality in both group

Variables	Teenage Mother N=150 (%)	Adult Mother N=150 (%)	X ² (df)	p-value
FSB	04 (02.7)	01 (0.7)	4.576 (4)	0.334
MSB	03 (02.0)	02 (01.3)		
Early Neonatal Death	03 (02.0)	01 (0.7)		
Neonatal Death	05 (03.3)	02 (01.3)		
Normal	135 (90.0)	144 (96.0)		

Discussion

Adolescence is primarily a period of development when the individual is not yet biologically or emotionally capable of reproduction. Consequently, if the girl is withdrawn from school at this juncture and coerced into marriage, it might result in significant psychological strain [3]. In addition, these adolescent females, who possess little or nonexistent understanding of contraception, often experience pregnancy shortly after getting married, intensifying the physical and psychological strain [4].

Teenage pregnancy is more prevalent among poorer socioeconomic groups, which leads to higher obstetric risks for both the mother and the foetus. Furthermore, pregnancy and childbirth among adolescent women carry an increased risk owing to inadequate utilisation of prenatal care or substandard antenatal services [5]. The increased occurrence of teenage pregnancy can be attributed to a lack of health education, religious restrictions on child marriage, and insufficient knowledge about family planning methods. This issue is further exacerbated by poor socioeconomic status, illiteracy, unhygienic living conditions, home confinements, and limited transportation options in remote areas [6].

The average age of adolescent mothers in our research was 18.25 years, whereas for adult mothers, it was 22.78 years, this was in accordance with previous research [7,8]. The majority of adolescent moms (58.7%) were from a lower socioeconomic position. It hinders their ability to make use of the existing amenities. Hence, a higher prevalence of pregnancy-related problems was seen among adolescent mothers. Similar findings were reported in multiple studies conducted in this domain [7-9].

The majority of adolescent moms in our research were from a rural location, accounting for 71.3%. This suggests that child marriage and early marriages are still widespread in rural areas. This outcome is similar to prior investigations [8, 10]. The majority of teenage moms in our research were Hindu, since Hinduism is the predominant religion in our area for both teenage and adult mothers. Additionally, our research revealed that a significant proportion of adolescent moms, namely 70.7%, lacked basic literacy skills. This lack of education contributes to the occurrence of early marriage, early pregnancy, and a worse quality of life. The fall in fertility and increase of self-confidence are highly connected with female literacy. [11]

Promoting the postponement of the age at which individuals engage in their first sexual intercourse, encouraging the delay of marriage, and advocating for the use of contraception [12]. The results of our research indicate that the rate of preterm birth was significantly greater among adolescent moms (20%) compared to mature mothers (6%). This is analogous to prior research conducted on outcomes of adolescent pregnancy [13,14]. However, research indicated that adolescent moms had a lower incidence of preterm births, although term and post-term deliveries were more prevalent among this demographic [15].

Vaginal delivery was the predominant method of childbirth among both adolescent and adult moms in our research. The prevalence of LSCS was substantially higher among adolescent moms (28.67%) compared to adult mothers (15.3%). Instrumental delivery occurred in 3.3% of adolescent moms and 0.7% of older mothers, a study reported similar findings [16]. Our research found that adolescent moms had a significantly greater

percentage (31.33%) of low birth weight infants compared to adult mothers (14.67%). This frequency was similar to two other studies conducted in a similar area [17,18]. Poor nutritional status, preeclampsia, and anaemia are potential causes of premature and low birth weight. Research found no correlation between maternal age and birth weight [19]. Our research found that the majority of infants, regardless of whether their moms were teenagers or adults, had an Apgar score between 7-10 at 5 minutes. The results obtained from this study were not found to be statistically significant. Neonatal problems were seen in 30.64% of young moms, whereas mature mothers had a lower rate of 11.33%. Birth asphyxia is a common complication, occurring in 11.3% of cases. The prevalence rates of Meconium Aspiration Syndrome, Neonatal Hyperbilirubinemia, Neonatal Sepsis, Foetal Anomalies, and Intestinal Perforation are 08.7%, 5.3%, 3.3%, 1.3%, and 0.7% respectively, the outcomes and their frequency were similar to other study conducted in this domain [20]. Our research revealed an early newborn mortality rate of 0.2% and a neonatal mortality rate of 3.3%.

Conclusion

The research has determined that the prevention of adolescent pregnancy and reduction of associated difficulties may be accomplished by using the following measures.

1. By enhancing the general socioeconomic position of our female population and optimising nutrition, particularly during pregnancy.
2. Enhancing the education of girls may have a substantial impact on their ability to make decisions about their own lives, postpone marriage, and cultivate self-assurance.
3. Recognition of the need to refrain from marrying before reaching the age of 20 years.
4. To prevent pregnancies before the age of 20, it is recommended to use contraception such as oral contraceptive pills and condoms, especially for married individuals, mostly owing to socioeconomic issues.
5. By enhancing the use of family planning services to decrease the incidence of adolescent pregnancies and mitigate their risks, as well as to prevent subsequent pregnancies via postpartum intrauterine contraceptive device (IUCD) insertion.
6. Receiving prenatal treatment that is both prompt and of high quality decreases the occurrence of anaemia, pregnancy-induced hypertension (PIH), intrauterine growth restriction (IUGR), foetal loss, and low birth weight (LBW) infants.
7. Enhanced newborn morbidity and mortality outcomes may be achieved by the provision of

superior facilities inside a well-equipped neonatal intensive care unit.

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