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A COMPARATIVE STUDY OF FETO-MATERNAL OUTCOME IN TEENAGE PREGNANCY VERSUS ADULT PREGNANCY

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Keywords:

Teenage pregnancy, Primigravida, Obstetric complications, Neonatal morbidity, Low birth weight, Preterm delivery

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ABSTRACT: Background: Teenage pregnancy is a significant public health concern, particularly in developing countries, and is often linked to higher risks of adverse obstetric and neonatal outcomes. This study aimed to assess the association between teenage pregnancy and fetomaternal morbidity and mortality, compared with adult primigravida pregnancies. **Materials and Methods:** A cross-sectional observational study was conducted from March 2021 to February 2022 in the Department of Obstetrics & Gynaecology, R.G. Kar Medical College and Hospital, Kolkata. A total of 300 primigravida women fulfilling inclusion criteria were enrolled and divided into two groups: Group A – teenage mothers (10–19 years, n=150) and Group B – adult mothers (20–35 years, n=150). Socio-demographic variables, antepartum complications, delivery details, postpartum complications, and neonatal outcomes were recorded and analysed using appropriate statistical tests. **Results:** Teenage mothers showed significantly higher rates of anaemia (72% vs 56.6%, p=0.005), hypertensive disorders of pregnancy (28.7% vs 18.7%, p=0.041), preterm deliveries (32% vs 18.7%, p=0.028), and genital tract injuries (16.7% vs 8.7%, p=0.037) compared with adults. Neonatal complications were also significantly more frequent in teenage pregnancies, including low birth weight (26.3% vs 11.6%, p=0.001), perinatal asphyxia (20% vs 9.5%, p=0.011), neonatal jaundice (17.2% vs 8.8%, p=0.032), and higher SNCU admissions (40% vs 25.2%, p=0.006). **Conclusion:** Teenage pregnancy is associated with higher maternal and neonatal morbidity compared to adult primigravida pregnancies. Considering it as a high-risk condition, targeted antenatal surveillance, health education, and promotion of contraceptive use are essential to improve outcomes.

INTRODUCTION: Teenage pregnancy is defined as a pregnancy occurring between the maternal ages of 10-19 completed years at delivery [1].

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Often the terms "Teenage pregnancy" and "Adolescent pregnancy" are used as synonyms. According to UNICEF, worldwide every 5th child is born to a teenage mother.

Worldwide 13 million births each year occur to girls younger than 19 years. The incidence of teenage pregnancies varies dramatically between the different countries. Approximately 90% of the teenage births occur in developing countries. Nevertheless, there is also a significant variation in

teenage pregnancy and birth rates between developed countries, although the teenage pregnancy and birth rate of developed countries are significantly lower than that of developing countries. Teenage pregnancy rate varies vastly between different countries and different regions within a country. Such pregnancies are seen mostly amongst the poorer and less educated sections of the society. In developed countries majority of teenage pregnancies occur to unmarried girls unlike developing countries including India where teenage pregnancies occur to married girls and are associated with early marriages [2].

This period of teenage or adolescent females is always taken as the intermediary stage of physical and mental health development from innocent childhood to procreating adulthood. Thus the pregnancies transpiring in teenage girls are usually classified to carry high risk in comparison to those in adult females [3]. In developing countries poor personal hygiene combining with low socio-economic status, compromised nutritional status and poor health care have been attributed to poor pregnancy outcome. Certain problems like preterm labour, pregnancy induced hypertension, sexually transmitted diseases, anaemia and low birth weight are strappingly implicated with adolescent pregnancy [4]. Younger teenage girls are often shorter, their bodies not yet fully mature and have lower bodyweight than older women as growth may not have stopped among the girls. They may require more nutrition during pregnancy than older women [5]. The major consequences of teenage pregnancy relate firstly to the social and economic impact and secondly upon the incidence of medical complications. Complications during pregnancy and childbirth are second cause of death under 19 years old girls globally. Girls aged 15-19 are twice as likely to die during pregnancy compared to women in their twenties and those under the age of 15 years are 5 times as likely [6].

The foetal outcome is significantly worse in teenage mothers with high incidence of low birth weight (LBW) babies, fetal growth restriction (FGR), still births and perinatal mortality though conflicting reports do exist [7]. Prevalence of teenage pregnancy is still high worldwide. The average global birth rate among 15to19 year old is 49 per 1000 girls and in India it is 33 in 2010-2014 [8].

The union health ministry has recorded the maximum number of teenage pregnancy cases in West Bengal, India [9].

The problem of teenage pregnancy and its adverse outcome is a major health issue. Contradictorily, some studies have showed that teenage pregnancy had favourable obstetric outcome. Whereas Konje *et al* (1992) reported in their study that early adolescents tolerated pregnancy well provided they book early and attend antenatal clinics regularly [10].

Aims & Objectives: The objective of this study was to determine whether teenage pregnancy was associated with increased risks of obstetrical complications and adverse birth outcomes in respect of feto-maternal morbidity and mortality compared to adult primiparas.

MATERIALS & METHODS: A cross-sectional observational study was conducted at the Department of Obstetrics & Gynaecology in R. G. Kar Medical and Hospital, Kolkata from 1st March 2021 to 28th February 2022. After proper clearence from Institutional Ethical Committee (Memo number: RKC/330, Dated:16/02/2021),and consent from the patient, the subjects are recruited in the study.

Sample Size: Sample size calculated using the following formula:

$$n= (Z^2 \times p \times q)/ d^2$$

Where, n= sample size, Z=Z statistics for a level of confidence, p = Expected prevalence of proportion (If the expected prevalence is 9.7% then p =0.09)[6]and d = precision (if the precision is 5% then d = 0.05).

$$p = 0.09, Z = 1.96, q = (1-0.09) = 0.91, d= 0.05$$

So (n) = $(Z_{1-\alpha/2})^2 \times p \times (1- p)/d2$(where $Z_{1-\alpha/2}$ = 1.96 [standard deviate]

$$(n)= (1.96)^2 \times (0.09) \times (0.91)/ (0.05)^2 \approx 125$$

Additional 10% was included for missing data / technical failures.

So, the sample was 125+10% 0f 125=137.5. The minimum sample size was 138, but to minimize the error sample size was increased to 150 in each group in present study.

Inclusion Criteria:

- Primigravida singleton pregnancy upto age of 35 years without any pre pregnancy co-morbidities.

Exclusion Criteria:

- Refusal of informed consent.
- Multiple gestation.
- Mothers with major illness existing from prepregnant state which will adversely affect the outcome of pregnancy (heart diseases, kidney problems, bronchial asthma, diabetes mellitus, chronic hypertension).

Study Population: After fulfilling the exclusion-inclusion criterions, total 300 patients were recruited in the study and divided into two groups:

- Group A (n= 150) -Primigravida singleton teenage pregnant mother aged between 10-19 years.
- Group B (n=150) -Primigravida singleton adult pregnant mothers aged between 20-35 years.

Patients in both groups are evaluated in respect of Age, ssocioeconomic status, antepartum complications (such as Anaemia, Antepartum haemorrhage, Hypertensive disorders in pregnancy, Gestational diabetes), mode of delivery, gestational age at delivery, postpartum complication (such as PPH, genital tract injury& sepsis), birth weight and neonatal complications.

Data Collection and Inerpritation: Pregnant women admitted in the labour room and fulfilling the exclusion- inclusion criteria were recruited after informed consent and evaluated by the following procedure – Detailed history taking with the risk factors based questioner, thorough clinical examinations and required investigations to assess the antenatal complications, delivery related data, postpartum complications and neonatal outcome in both groups.

RESULTS: A total of 300 primigravida mothers were selected according to exclusion-inclusion criteria. There were 150 primigravida mothers in both groups. In our study, 58.7 % of teenage mothers were from rural area in comparison to45.4% mothers in adult group and it is statistically significant findings (p=0.020). In this study majority of the patients (47.4% and 44.7% in teenage and adult group respectively) had primary education. Whereas only 12.6% patients in teenage group and 17.3% in adult group completed their higher secondary education. In our study, 82.6% teenage mothers were home maker whereas 81.3% adult mothers were homemaker. Our study shows 46.6% teenage mothers belongs to lower class which is significantly (p=0.008) more than adult group (30%). In our study, only 8 % teenage mother and 12% adult mother used some form of contraceptives **Table 1.**

Table 2 shows that teenage group had significant incidence of anaemia than adult group (72% vs 56.6% respectively, p=0.005). Among the anaemia the most common was mild anaemia in both group (66.7% vs 63.5% respectively) where as severe anaemia was seen in 10.2% of teenage group and 8.3% Or adult group. In our study antepartum haemorrhage (APH) was seen in 6 cases of adult group and only 2 cases in teenage group. There was no significant difference of incidence of gestational diabetes mellitus (GDM) in two groups (11.4% vs 17.4% respectively). In this study the incidence of hypertensive disorder of pregnancy (HDP) was significantly more among teenage mother in comparison to adult mother (28.7% vs 18.7% respectively, p=0.041) **Table 2.**

From **Table 3** it is seen that the mode of delivery was comparable in both group. Though the incidence of vaginal delivery was slightly higher in teenage group (81.4% vs 75.4% respectively) and caesarean section rate was more in adult group (18% vs 13.3% respectively) but it is statistically non-significant. In our study pre-term delivery rate was significantly more in teenage group (32% vs 18.7% respectively, p=0.028) and term delivery was slightly more in adult group (76.6% vs 64.7% respectively) but not significant statistically **Table 3. Fig. 3** shows that the incidence of genital tract injury was significantly more in teenage group (16.7% vs 8.7% respectively, p=0.037). Whereas incidence of postpartum haemorrhage (PPH) and puerperal sepsis was comparable in both group (6% & 4.7% vs 8% & 3.4% respectively). In this study **Fig. 2** shows that live birth rate was comparable in

both groups (98% vs 96.6% in teenage and adult group respectively). 5 patients in adult group had still born in comparison to 3 cases in teenage group. **Table 4** shows significantly more incidence of low birth weight (LBW) baby in teenage group (26.3% vs 11.6% respectively, p=0.001). Perinatal asphyxia was seen in 20% of teenage group in comparison to 9.5% in adult group which is statistically significant (p=0.011). Similarly incidence of neonatal jaundice was also significantly more in teenage group than adult group (17.2% vs 8.8% respectively, p=0.032). From this table it is observed that overall SNCU admission was also significantly more in teenage group (40%) in comparison to adult group (25.2%) and it is statistically significant finding.

TABLE 1: COMPARISON OF SOCIO-DEMOGRAPHIC PROFILE BETWEEN TEENAGE AND ADULT GROUP

Parameters	Teenage pregnancy (n=150)	Adult pregnancy (n=150)	P-value
Age (Years)			
≤19	150	0	
≥20	0	150	
Mean ± SD	16.5±1.25	27.5±3.75	
Residence			
Rural	88(58.7%)	68(45.4%)	0.0208
Urban	62(41.3%)	82(54.6%)	
Educational Status			
Primary	71(47.4%)	67(44.7%)	0.526
Secondary	60(40%)	57(38%)	
Higher secondary	19(12.6%)	26(17.3%)	
Occupation			
Homemaker	124(82.6%)	122(81.3%)	0.763
Working	26(17.4%)	28(18.7%)	
Socio-economic Status			
Lower class	70(46.6%)	45(30%)	0.008
Upper lower class	61 (40.7%)	74(49.3%)	
Lower middle class	19(12.7%)	31(20.7%)	
Contraception			
Yes	12(8%)	18(12%)	0.248

TABLE 2: COMPARISON OF ANTEPARTUM COMPLICATIONS BETWEEN TWO GROUPS

Complication	Teenage(n=150)	Adult(n=150)	P-value
Anaemia	108(72%)	85(56.6%)	0.005
Mild	72(48%)	54 (36%)	
Moderate	25 (16.7%)	24 (16%)	
Severe	11 (7.3%)	7 (4.6%)	
APH	2(1.4%)	6(4%)	0.151
GDM	17(11.4%)	26(17.4%)	0.138
HDP	43(28.7%)	28(18.7%)	0.041

TABLE 3: COMPARISON OF DELIVERY DETAILS BETWEEN TWO GROUPS

Parameters	Teenager Group (n=150)	Adult group (n=150)	p-value
Mode of delivery			
CS	20 (13.3%)	27(18%)	0.447
Instrumental	8(5.3%)	10(6.6%)	
VD	122(81.4%)	113(75.4%)	
Gestational age at delivery			
Preterm	48 (32%)	28(18.7%)	0.028
Term	97(64.7%)	115(76.6%)	
Post term	5(3.3%)	7(4.7%)	

TABLE 4: NEONATAL OUTCOME AMONG TEENAGERS AND ADULT MOTHERS

Parameters	Teenager group (n=145)	Adult group (n=147)	p-value
Birth weight			
Normal	107(73.7%)	130(88.4%)	0.001
LBW	38(26.3%)	17(11.6%)	

Perinatal asphyxia			
Yes	29(20%)	14(9.5%)	0.011
No	106(80%)	133(90.5%)	
Neonatal Jaundice			
Yes	25((17.2%)	13(8.8%)	0.032
No	120(82.8%)	134(91.2%)	
SNCU admission			
Yes	58(40%)	37(25.2%)	0.006
No	87(60%)	110(74.8%)	

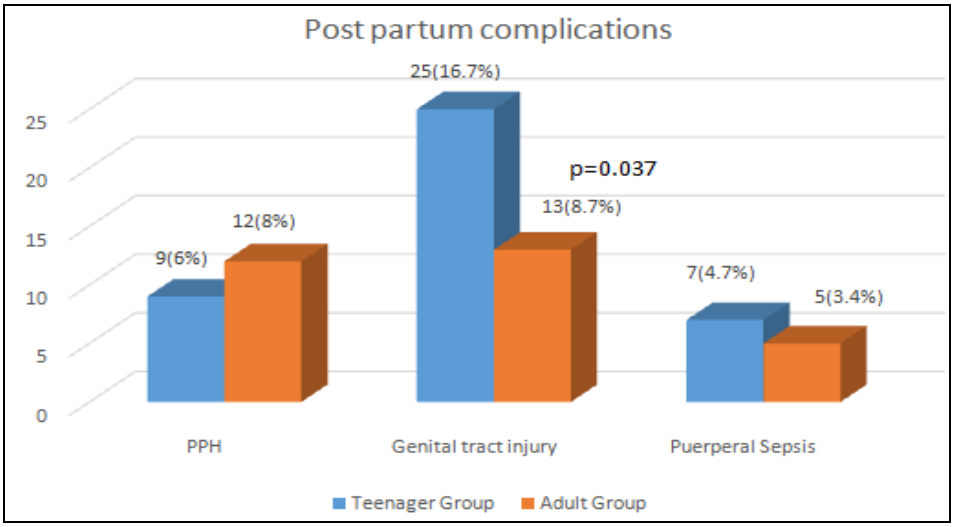

FIG. 1: COMPARISON OF POSTPARTUM COMPLICATIONS BETWEEN TWO GROUPS

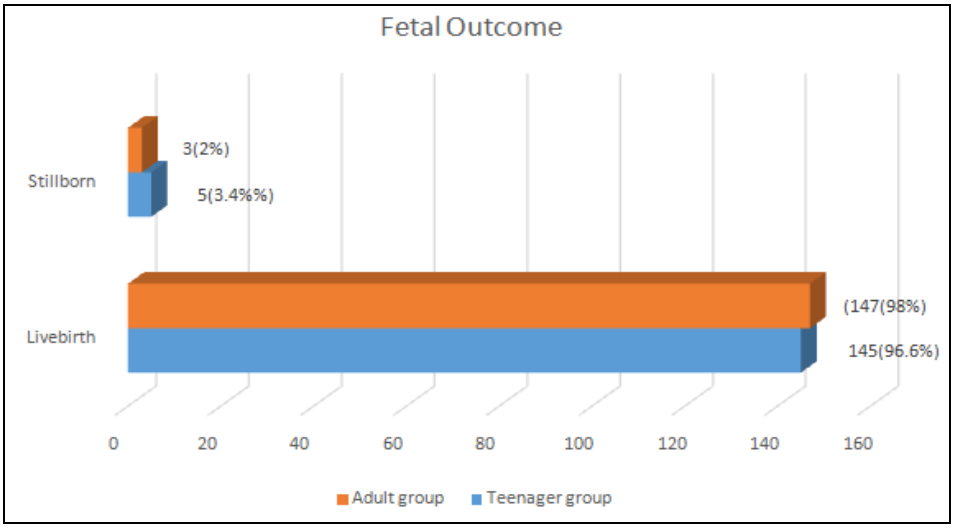

FIG. 2: FETAL OUTCOME IN TWO GROUPS

DISCUSSION: A total of 300 primigravida mothers were selected according to inclusion criteria. There were 150 primigravida teenage mothers and 150 primigravida mothers of 20-35 years. Mean age of teenage mother was 16.5±1.25 and adult mother was 27.5±3.75. In our study, 58.7% of teenage mothers were from rural area in comparison to 45.4% mothers in adult group. Low socio-economic status, lack of social awareness, increased rate of early marriage, unhealthy maternal behaviour and limited access to healthcare resources may be the reason of more incidence of teenage pregnancy in rural areas. In this study majority of the patients (47.4% and 44.7% in teenage and adult group respectively) had primary education. Whereas only 12.6% patients in teenage group and 17.3% in adult group have their higher secondary education. Our study shows 46.6% teenage mothers belongs to lower class which is significantly (p=0.008) more than adult group (30%). These findings were consistent with the studies conducted by Patel *et al* [11]. Teenage group

had significant incidence of anaemia than adult group (72% vs 56.6% respectively, p=0.005). Among the anaemia the most common was mild anaemia in both group (48% vs 36% respectively) where as severe anaemia was seen in 10.2% of teenage group and 8.3% of adult group. This finding is supported by Shah N *et al.* where they have shown that teenage population is at higher risk of anaemia because of frequent dietary deficiency [12]. On the other hand study by Sharmin N *et al* and Paladughu *et al* showed that there is no difference in incidence of anaemia in both group [13, 14].

In our study antepartum haemorrhage (APH) was seen in 6 (4%) cases of adult group and only 2 (1.4%) cases in teenage group. There was no significant difference of incidence of gestational diabetes mellitus (GDM) in two groups (11.4% vs 17.4% respectively). Similar result observed by Saxena P *et al* and Verma P *et al* that there was no significant difference between occurrence of APH, GDM between the two groups [15, 16].

In this study the incidence of hypertensive disorder of pregnancy (HDP) was significantly more among teenage mother in comparison to adult mother (28.7% vs 18.7% respectively, p=0.041). Study by Pooja Verma *et al* corroborate our findings where they have shown that severe preeclampsia is significantly higher among teenagers compared to adult group (20% vs 4%) [16]. On contrary to this, incidence of hypertensive disorders was similar (6.4% and 5.6% respectively, p=0.66) in study by Kayasthya S *et al* [6].

Incidence of vaginal delivery was slightly higher in teenage group (81.4% vs 75.4% respectively) and caesarean section rate was more in adult group (18% vs 13.3% respectively). Regarding mode of delivery, we find conflicting reports as many studies have reported increased operative deliveries but others found less operative interventions among teenage mothers compared to adult mothers [17, 18, 19]. Caesarean delivery was significantly lower among the teenagers in this setting, which is similar to other South African study. A rural hospital-based South African study found lower rate of caesarean delivery among teenage mothers [20]. A recent Austrian study reported that during the last 18 years, caesarean rate among the adolescents remained the same [21]. A Saudi Arabian study indicated that cases of caesarean delivery did not differ between teenage and older mothers [22]. In our study pre-term delivery rate was significantly more in teenage group (32% vs 18.7% respectively, p=0.028) which may be attributed to biological immaturity, poor nutrition, inadequate antenatal care, lower levels of education and infection due to poor hygiene. This finding corroborated with the study by Pooja Verma *et al* showing preterm birth of 18% in teenage group vs 4% in adult group [16] and by Mukhopadhyay P *et al* showing the teenage mothers had a significantly higher number of preterm deliveries compared to the adult mothers (27.7% vs 13.1% respectively, p< 0.05) while the reverse was noted in post-term deliveries [23]. Whereas study by Hoque M *et al* showed that there is no difference of incidence of preterm labour in both groups (12.1% vs 12.2% respectively) [20].

The incidence of genital tract injury was significantly more in teenage group (16.7% vs 8.7% respectively, p=0.037). This is probably due to anatomical prematurity of pelvis, rigid perineum resulting in increased muscle tone. The study by Alexandra Matei *et al* showed that all laceration groups were more often identified among young mothers compared to their older counterparts [24]. However our finding is contrary to the theory that advanced maternal age is associated with adverse perinatal outcome [25].

Incidence of low birth weight (LBW) baby in teenage group is significantly more in our study (26.3% vs 11.6% respectively, p=0.001). This may be due to factors like immaturity, premature birth, nutritional deficiency and infection. This finding is supported by many other studies [26, 27, 28, 29, 30, 31]. Study by Alwahab AA *et al* observed that19.8% babies weighing less than 2500grams born to teenage mothers compared with 6.89% babies in the older age group and this difference was statistically significant [32].

In present study perinatal asphyxia was seen in 20% of teenage group in comparison to 9.5% in adult group which is statistically significant (p=0.011). Similarly, incidence of neonatal jaundice was also significantly more in teenage group than adult group (17.2% vs 8.8% respectively, p=0.032). From our result it is observed that overall SNCU admission was

significantly more in teenage group (40%) in comparison to adult group (25.2%) and it is statistically significant finding. So, neonatal morbidities like incidence of birth asphyxia and neonatal hyperbilirubinemia were significantly more in the teenager group leading to more SNCU admission. The reason may be higher number of premature and low birth weight babies in this age group and supported by different authors [23, 29]. Studies by Dutta I *et al* [33] and Kumar A *et al* [34] reported the same findings in their studies.

CONCLUSION: From the present study it is observed that Preterm labour, Hypertensive Disorders of Pregnancy, Premature Rupture of Membrane, anaemia and genital tract injury were major maternal complications in teenage pregnancy. Low Birth Weight, Foetal growth restriction (FGR), perinatal asphyxia, neonatal jaundice and SNCU admission were major adverse foetal outcomes in comparison to adult pregnancy. Teenage pregnancy today, still represent one of the most important public health problems. There is no doubt that the obstetrical problems can be managed by modern medicine and so the risk of Teenage pregnancy can be diminished. The health care provider should consider teenage pregnancy as a 'high risk' pregnancy and should educate the pregnant teenagers to have more number of antenatal visits so that the signs and symptoms of various complications of teenage pregnancy could be recognized and managed at the earliest.

Attention should be given to use of various screening and diagnostic tests and to intervene if any complications occur during the course of pregnancy or labour. Proper monitoring of the progress of labour is important to prevent postpartum complications. Education of the female child can play a significant role in delaying marriage and hence delaying childbearing, thus protecting the young girl from being exposed to the various complications of teenage pregnancy. There is a need to promote the use of contraceptives amongst the married teenagers by ensuring the availability of contraceptives at a wider scale. Good antenatal and intranatal services, adequate neonatal services, contraceptive services all together can minimize the various risks associated with teenage pregnancies to a large extent. With all these measures, we can hope for a world-wide decline in the trend of teenage pregnancy rates and complications in the years to come.

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