Original Article

Teenage pregnancy complications and outcomes in a tertiary care hospital

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To investigate the problem of teenage pregnancy with a view to study complication and outcomes through a case control format. A prospective case control study, where 50 cases of teenage pregnant women (13-19 years) were compared with 50 cases of control (20-29 years) for fetal and maternal outcomes in one year period. The exclusion criteria included medical or surgical disorders like diabetes, hypertension, convulsive disorder, tuberculosis, hypothyroidism, renal disorder, severe cardiac or liver disease (except anaemia and protein energy malnutrition), ectopic pregnancy, molar pregnancy, multiple pregnancy etc). For each case recruited, the next antenatal client attending the hospital and fulfilling the criteria was selected as control. Semi-structured open ended questionnaire was provided to each case and control in their language. Women were followed up till delivery. Feto-maternal outcome at the end of pregnancy was noted. The mean age of teenagers was 18.7 years compared to 22.4 years in control. All were nullipara with 48% teenagers being illiterate. Statistically significant association was noted for occurrence of mild anaemia, severe pre-eclampsia, preterm labour and UTI. 32% of teenage mothers required induction at the time of labour, and occurrence of low birth weight, birth asphyxia, and NICU admission was significantly high. Teenage pregnancy, a social problem distributed worldwide, continues and has serious implications on maternal and child health, especially in the context of developing countries.

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Key words **: Teenage pregnancy, feto-maternal outcomes, low birth weight, severe pre-eclempsia.**

Adolescence is a period when structural, functional and psychosocial developments occur in a child to prepare her for assuming the responsibility of mother-hood[1]. World health organization

defines Teenage Pregnancy as "any pregnancy from a girl who is 10-19 years of age," the age being defined as her age at the time the baby is born[2]. It is not limited to any social, economic, racial or ethnic groups[3].

Worldwide rates of teenage pregnancy range from 2.9 per 1000 in South Korea to 143 per 1000 in some sub-Saharan African countries[4]. Approximately 90% of the teenage births occur in developing countries[5]. Nevertheless, there is also a significant variation in teenage pregnancy and birth rates between developed countries. Socio demographic factors surrounding teenage pregnancy are different in developing and developed countries of the world[6].

Teenage pregnancy is of serious concern because maternal age plays a significant role in adverse outcome[7]. The combination of poor nutrition and early child bearing expose young women to serious health-risks during pregnancy and childbirth, including damage to the reproductive tract, pregnancy-related complications, such as anaemia, pregnancy-induced hypertension, preterm labour, cephalopelvic disproportion, maternal mortality, perinatal and neonatal mortality, and low birth weight[8,9]. However these complication are also connected to the biological age itself, as it was observed in teen births even after controlling for other risk factors (such as utilisation of antenatal care etc) About 16 million 15-19 years old teen age girl give birth each year, about 11% of all births worldwide. Ninety-five per cent of these births occur in low- and middle-income countries. The average adolescent birth rate in middle income countries is more than twice as high as that in high-income countries, with the rate in low-income countries being five times as high[10].

Editorial Comments :
- **Teenage pregnancy causes serious problems of maternal & child health**
- **Anaemia, Pre eclamsia, preterm birth, LBW babies common in teenage pragnancy**

This study aims at investigating the problem of teenage pregnancy with a view to study complication and outcomesd through a case control format.

Materials and Methods

It is a prospective case control study, wherein 50 cases

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of teenage pregnancy (13-19 years) were compared with 50 cases of control (20-29 years) for fetal and maternal outcomes in one year period. Approval from the ethical committee of the hospital was obtained. Informed written consent was obtained from all participants.

The design of this study was a comparative case – control type. The inclusion criteria for cases were age from 13-19 year with singleton intrauterine pregnancy confirmed by Ultrasound. The exclusion criteria included h/o medical or surgical disorders like diabetes , hypertension, convulsive disorder, tuberculosis, hypothyroidism, renal disorder, severe cardiac or liver disease (except anaemia and protein energy malnutrition), ectopic pregnancy, molar pregnancy, multiple pregnancy, Genital tract infection like syphilis, HIV, women with major skeletal deformities like kyphoscoliosis/polio/fractures, and morbid obesity.

Selection of controls was based on the same inclusion and exclusion criteria except that they were of age group (20-29 years). For each case recruited, the next antenatal client attending the hospital and fulfilling the criteria was selected as control. Semi-structured open ended questionnaire was provided to each case and control in their language. Antenatal workup was done on scheduled visits. An early pregnancy scan was performed followed by a target scan at 18-20 weeks and Doppler examination at 34-36 weeks of gestation. Visits to the antenatal department were every 4 weeks till the 28th weeks of gestation and then fortnightly till 34th week and then weekly till term. The protocol was modified in the presence of antenatal complications. Statistical testing was conducted with the statistical package for the social science system version SPSS 17.0. Continuous variables are presented as mean ± SD, and categorical variables are presented as absolute numbers and percentage. The comparison of normally distributed continuous variables between the groups was performed using Student's t test. Nominal categorical data between the groups were compared using Chi-square test or Fisher's exact test as appropriate. P<0.05 was considered statistically significant.

Results

The mean age of teenagers was 18.7 years and the mean age of control group was 22.4 years in our study.

All the cases and controls were married and nulliparous. The women in the teenager group had no previous abortion while 6% in control group had a history of abortion previously, stillthese two groups were comparable.

Analysis of educational status of the two groups (Table 1), revealed that 48% of the teenage mothers were illiterate compared to 12% of control group which was significant.

Socioeconomic status (Table 2), shows that 66% of cases belong to the lower and upper lower class vs only 40% in control group.

Table 3 shows the results of analysis of antenatal history of all study subjects. In general, the quality of antenatal care in the teenagers was found to be inadequate. From the study it was proven that among the cases only 38 % were regular in their compliance to antenatal care (Booked). On the other hand antenatal care was regular in 62 % of the controls. Compliance for intake of hematinics was also significantly less in case group.

Table 4 summarizes maternal outcome in study subjects. Statistically significant association was noted for occurrence of mild anaemia, severe pre eclampsia, preterm labour and UTI. Overall anaemia (by WHO criteria) was more prevalent in case group as compared to control group (94% *versus* 76%) (p= 0.016). Similarly pre-eclampsia occurred more frequently in case group (26%) as compared to 8% in control group. Incidence of severe preeclampsia was significantly higher among case group (p=0.028). Preterm birth occurred in 18% of case group and only in 4% of control group (p= 0.05). UTI occurred in 36% of case group and only in 2% of control group, (p<0.001). Occurrence of oligohydromnios, IUGR, APH, PROM, CPD, eclampsia, malpresentation, PPH, Doppler abnormality were not statistically significant and both the groups

Table 1 — *Educational status*

	Frequency	%	Frequency	%	
Illiterate	24	48%	6	12%	<0.001
I-V	Education	Cases	Controls	P Value	0.826
V-X	7	14%	24	48%	0.0002
X-XIIth	3	6.0%	5	10.0%	0.715
Grad	1	2%	1	2%	-
Total	50	100%	50	100%	

Table 2 — *Socioeconomic status*

SES	Cases		Controls		P Value
	Frequency	%	Frequency	%	
Lower	25	50.0%	20	40.0%	0.315
Upper Lower	8	16.0%	0	0.0%	0.006
Lower middle	8	16%	15	30%	0.096
Upper Middle	1	2.0%	3	6.0%	0.617
Upper	8	16.0%	12	24.0%	0.317
Total	50	100%	50	100%	

Table 3 — *Antenatal care*

Variable	Cases		Controls		P Value
	Frequency	%	Frequency	%	
Regularity (booked)	19	38.0%	31	62.0%	0.016
Haematinics compliance	19	38.0%	34	68.0%	0.003

were comparable with respect to these variables.

Table 5 summarizes the clinical obstetrical aspects of the study subjects. In our study 32% of teenage mothers had undergone induction at the time of labour, while only 10% of controls needed induction, (p= 0.007). Many of the women in these groups required assistance like LSCS or instrumental deliveries. However, the incidence of malpresentation, caesarian section and instrumental deliveries were comparable between two groups.

Table 6 (A&B) depicts the fetal outcome in study subjects. Statistically significant association was noted for occurrence of low birth weight (6A), birth asphyxia, and NICU admission when groups were compared. Incidence of low birth weight was more in teenage mothers (80%) in comparison to controls (18%) even when preterm babies were excluded. Birth asphyxia was found in 24% of teenage mothers as against 6% of control group (p=0.023). Newborns of 30% of teenage mothers while that of 10% of control group needed NICU admission (p =0.012). No GCA was found in any of the fetuses of the study subjects. Incidence of hyperbilirubenemia was insignificant in both groups. There was 8% perinatal mortality in each group.

Forty one among fifty cases had term delivery of which 80%[33] had a birth weight of less than 2.5 Kg, a significant finding.

Table 4 — *Maternal outcome*

Variable	Cases		Controls		P Value
	Frequency	%	Frequency	%	
Anaemia :					
Mild	44	88.0%	34	68.0%	0.016
Moderate	2	4.0%	3	6.0%	1
Severe	1	2.0%	1	2.0%	1
Pre-eclampsia :					
Non severe	3	6.0%	2	4.0%	1
Severe	10	20.0%	2	4.0%	0.028
Preterm	9	18.0%	2	4.0%	0.05
Oligohydromnios	5	10.0%	2	4.0%	0.436
IUGR	4	8.0%	2	4.0%	0.678
APH	2	4.0%	1	2.0%	1.000
PROM	1	2.0%	0	0.0%	1.000
CPD	3	6.0%	2	4.0%	1.000
ECLAMPSIA	1	2.0%	0	0.0%	0.097
Malpresentation	4	8.0%	4	8.0%	1.000
Doppler (normal)	49	98.0%	50	100.0%	1.000
UTI	18	36.0%	1	2.0%	<0.001
PPH	1	2.0%	2	4.0%	1.000

Table 5 — *Obstetrical Outcome*

Variable	Cases		Controls		P Value
	Frequency	%	Frequency	%	
Labour Induced	16	32.0%	5	10.0%	0.007
Spontaneous	34	68.0%	45	90.0%	0.007
Malpresentation	4	8.0%	4	8.0%	1.000
LSCS	13	26.0%	7	14.0%	0.134
Instrumental delivery	3	6.0%	2	4.0%	1.000

Table 6A — *Birth Weight*

BtWt<2.5 (Y/N)	Cases with term gestation		Cases with term gestation		P Value
	Frequency	%	Frequency	%	
Y	33	80.0%	9	18.0%	<0.001
N	8	20.0%	39	82.0%	
Total	41	100%	48	100%	

Table 6B — *Fetal Outcomes*

Variable	Cases		Controls		P Value
	Frequency	%	Frequency	%	
GCA (No)	50	100.0%	50	100.0%	-
Birth asphyxia	12	24.0%	3	6.0%	0.023
NICU Admission	15	30%	5	10%	0.012
Hyperbilirubinemia	8	16.0%	9	18.0%	0.790
Perinatal mortality	4	8.0%	4	8.0%	1.000

Discussion

Teenage pregnancy is one of the most important social and public health problem all over the world with varying prevalence rate[11,12]. Teenage pregnancy is a serious challenge for health care systems. Teenagers make up more than one billion ie, nearly one fifth of the world population[13]. In India the age group of 15-19 years accounts for 19 per cent of the total fertility of the country with about 58 per cent of the total adolescents commencing childbearing (NFHS I)[14] and almost 23 per cent of the women aged 15-19 years give birth to a second child by the time they are 20 years old (NFHS II)[15].

Teenage pregnancies put mothers at high risk to many health related complications and their new born to poor birth outcomes[16]. Adverse outcomes of teenage pregnancy arise not only from physical and medical causes but are also associated with individual, familial and sociocultural factors besides lack of access to healthcare, contraception and other resources which is prevalent in most developing countries.

The sociodemographic factors were found to play a pivotal role in our study, 48% of teenagers were illiterate and 66% belonged to lower and upper lower class similar to earlier observations[16,17]. The role of literacy is aptly shown by the low incidence of teenage pregnancy (0.3%) in Kerala which has high female literacy. Low socioeconomic status leads to various social evils including teenage pregnancy[17]. Similar results regarding socioeconomic status in teenage mothers was seen by Mauleshmodi[18], Chandrika Doddihal[19] *et al* (2016).

In our study antenatal registration and care among teen-

agers were low. This can be attributed to lack of awareness, maturity, and family support[20-22].

Overall maternal morbidity is high in teenage group. Significant maternal complications observed in the study were anaemia, pre eclampsia, preterm labour and UTI. Similar results have been noted in various other studies. Shabnam *et al*[20], Soubhagya Talawar[23] *et al*, Aimen Sarwar[24] *et al*, Neha[25] *et al*, Demetra[26] *et al*, have all found higher incidence of anaemia among teenager group possibly due to poor nutritional status, low socioeconomic status and less iron stores in the body which may be attributed to early initiation of menstruation, altered dietary habits etc. Soares *et al* 2010[27] have shown that even if the woman is not anaemic at conception, she may have decreased iron stores leading to poor outcomes of pregnancy as iron requirement increase three folds in pregnancy. In adolescent there is increased requirement of nutrient for the complete growth of body itself, if adolescent girls get pregnant in this age then fetomaternal competition for nutrients occur which result into anaemia and low birth weight babies.

Many studies[23-25,28-30] also found higher incidence of preeclampsia among teenager group. High incidence of severe pre eclampsia in adolescent can be attributed to non physiological issues including the nulliparity and the lack of prenatal care[30].

UTI is found to be more common in teenagers in our study. Similar results are found in studies conducted by Shabnam[20], Ganchimeg[29] and Demetra[26] *et al*. Adolescent women are at high risk for getting subclinical infection because of the physiologic immaturity of the body and the consequent susceptibility of the tissue to infection.

There is significant association between maternal age and preterm birth which has been amply discussed in earlier studies[23-25,31-33]. The possible cause is immaturity of the uterine and cervical blood supply which may predispose teenage mothers to subclinical infection, an increase in prostaglandin production, and a consequent increase in the incidence of preterm delivery[11,34,35] as has been reported in our study.

Occurrence of oligohydromnios, IUGR, APH, PROM, CPD, eclampsia, malpresentation, PPH , or Doppler abnormality were not statistically significant in our study and both the groups were comparable with respect to these variables similar to earlier observations[23,25,26,36].

Significant fetal complication depicted in our study is low birth weight after excluding preterm neonates. Similar results were found by Ahlam[31] *et al*, L Lama[32] *et al*, Samar Rudra[33], and Indranil D[22] *et al*. Low birth weight is a key predictor of malnutrition and an important determinant of child mortality[37]. Babies born to teenage mothers are also likely to be preterm, hence, the incidence of low birth weight is even higher in them as has been found in our study. This may be related to conception within 3 years of menarche, low body mass index, past history of sexual abuse, socially deviant father of the baby and vaginal bleeding during first 8 weeks of pregnancy[38].

In our study birth asphyxia is significantly higher among teenagers. Similar findings were obtained by Prianka[16], Lama[32], and Indranil[22] *et al*. This can be attributed to high rate of premature birth among teenagers. Low socio economic status may be highly associated with birth asphyxia. The interaction between maternal infections and prematurity may be important target for future community based interventions to reduce the global impact of birth asphyxia on neonatal mortality[39].

A significant NICU admissions among new born of teenage mothers was noted, probably because of high incidence of low birth weight, preterm birth and birth asphyxia among this group. This observation found support in studies of Shabnam[20] *et al*, Ahlam[31] *et al*, and Samar Rudra[33].

Conclusion

Teenage pregnancy, a social problem distributed worldwide, has serious implications on maternal and child health, especially in the context of developing countries. Biological, social and familial implications make the teenage women vulnerable to many child birth related problems. Improving the general health and nutrition of the girl child, increasing the age of childbearing along with timely and quality ante-natal care may reduce the incidence of anaemia, Pre eclampsia, UTI, Preterm birth, LBW babies, Birth asphyxia, and NICU admission.

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