



OBSTETRICAL AND PERINATAL OUTCOME IN TEENAGE PREGNANCIES IN SUB-HIMALAYAN REGION

Obstetrics & Gynaecology

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ABSTRACT

Objectives: To assess the quantum of problem of teenage pregnancy, ascertain the different risk factors associated with and to evaluate outcome of pregnancy in teenage mothers. **Design:** Hospital based prospective case control study. **Setting:** Department of Obstetrics and Gynaecology, Central Referral Hospital (CRH), a teaching hospital of Sikkim Manipal Institute of Medical Sciences, Sikkim, India. **Participants:** All teenage pregnant women (aged 13-19 years) and Non teenage pregnant women of same gestational age as of teenage pregnant women admitted for delivery. **Primary outcome measures:** Incidence of Teenage Pregnancy and the maternal and neonatal outcomes. **Results:** Teenage pregnancy rate was found to be 5.51%, with statistically significant number of patients being those referred to our hospital. The mean age of teenage mothers was found to be 18.5 +/- 0.66 years, with 60.80% from lower class. 40.80% patients had Anemia, whereas PIH and thrombocytopenia was seen in 8 (7.20%) and 1 (0.80%) patients respectively. 76.80% of teenage delivered vaginally, but statistically significant higher cesarean was in Non-Teenage pregnancies ($P < 0.0001$). The incidence of PPH was found to be statistically high ($P = 0.0357$) in teenage pregnancies. More LBW babies were born to teenage mother ($P < 0.05$), and admission rates in NICU was found to be statistically significant ($P = 0.042$). **Conclusions:** To conclude teenage pregnancy is associated with increased maternal as well as neonatal morbidity and mortality. Reduction in teenage pregnancies can be achieved through education, awareness programs, sex education and free and easy access to effective contraception.

KEYWORDS

Teenage Pregnancy, Maternal morbidity, Perinatal morbidity

INTRODUCTION:

Teenage pregnancy, defined as pregnancy occurring after menarche up to 19 years¹, is riddled with conflict between various biological and social factors with concurrent physical, psychological, emotional, and social development. Worldwide, death rate from causes related to pregnancy are particularly high in girls less than 18 years.

In developing countries, teenagers account for 20 percent of population, ignorance of contraceptive methods and difficulty obtaining them, increases pregnancy in teenagers. India has approximately 150 million adolescent's girls who are at the risk of teenage pregnancy because of early puberty, poverty, illiteracy, lack of awareness about contraceptive methods, early and child marriages and sometimes sexual abuse. The practice of early marriage in south East Asian countries such as India, Pakistan, Nepal, Africa and Bangladesh is also one of the important reasons of teenage pregnancies in this part of the world². Teenage pregnancy is also an important public health problems faced by developed nations with approximately 30% of pregnancies in the United States of America (USA) being in teenage girls (1 million each year)³.

Various biological, psychological, socio-demographic and behavioural factors such as lack of information and access to family planning services, social ostracisation and various psychological problems adversely influence the outcome of teenage pregnancy. The teenage girl who has still not achieved full maturity as to be able to take care of herself during difficult situation, can hardly be expected to take care of her newborn child. Moreover, there is an increased incidence of preterm deliveries with its associated complications such as hyaline membrane disease, anaemia, neonatal hypoglycaemia, hyperbilirubinemia and need for neonatal intensive care. Incidence of low birth weight babies, shoulder dystocia, APGAR scores less than 7 at 5 minutes, hypoxic ischemic encephalopathy, respiratory distress, neonatal sepsis and meningitis and neonatal seizures have been reported to be higher in newborn babies of teenage mothers⁴.

METHODS:

This study was a Hospital based prospective case control study conducted in the Department of Obstetrics and Gynaecology, Central Referral Hospital (CRH), Sikkim. 125 teenage pregnant women and a representative group of equal number of non-teenage pregnant women of same gestational age were included in the study (Universal Sampling).

Inclusion Criteria:

- All teenage pregnant women (aged 13-19 years) admitted for delivery at CRH.

- Patient or caregiver given consent to participate in the study.
- Control Group - Non teenage pregnant women of same gestational age as of teenage pregnant women and given consent to participate in this study were selected.

Exclusion Criteria:

- Patients/ Caregiver who refused to give consent to participate in this study.

A detailed history of present pregnancy regarding date of last menstrual period, previous antenatal visits, vaccination against tetanus etc. was obtained from all the patients, history of bleeding, per vaginal discharge or leaking if present was also noted. Detailed past history, obstetric and menstrual history, family and personal history was noted. Evidence of anemia and severity of anemia was also noted. Presence of edema was recorded. All previous ultrasound reports were reviewed. If the patient was found to have been referred from some other hospital then the reason for such referral was also noted down.

Relevant systemic examination was done. Per abdominal examination was done to note down the height of uterus, position, lie, presence or absence of contractions, presence of FHS and its rate and rhythm were noted. Any signs of obstructed labor like bladder wall edema, bowel distension and bandl's ring were also noted. Per vaginal examination was done in all cases (except in cases where it was contra-indicated such as in case of central Placenta Previa, antepartum hemorrhage etc.) to look for cervical effacement, dilatation, presence or absence of membranes, station of presenting part, presence of caput or moulding, pelvic assessment was done by Muller Munro- Kerr method and disproportion if any was noted. Any evidence of vaginal leak, foul smelling discharge, bleeding, and presence of clots, vaginal or cervical tears were noted.

Basic investigations complete blood count, bleeding time, clotting time, blood grouping and Rh typing, HIV, VDRL, Hb_sAg were done. Baby whether born alive or still born was noted. All deliveries/ cesarean sections were attended by a pediatrician and neonatal resuscitation if needed was also done by the attending pediatrician. APGAR scores at 1 minute and 5 minutes were noted. If 5-minute Apgar score was found to be less than 7 then the APGAR score was taken up to 20 minutes.

Causes of perinatal and neonatal mortality were noted. Mothers were followed up in postoperative period and any complications such as fever, necessity of blood transfusions, wound infection or gaping (in case of LSCS), bleeding PV and number of days of hospital stay were noted. Before discharge all mothers were advised about exclusive

breast feeding and motivated for contraception during their postpartum period. They were further prescribed iron and calcium supplementation. Advice regarding diet and neonatal care was given to mothers and the other caregivers.

RESULTS

This was a hospital based prospective case control study of outcome of women with teenage pregnancies in CRH studied over a one year period. During this period a total 2268 deliveries took place out of which there were 125 teenage deliveries. Hence the teenage pregnancy rate over the study period was found to be 5.51%.

Type of cases	No of Cases	Percentage
Non-Teenage Pregnancies	2143	94.49%
Teenage Pregnancies	125	5.51%
Total	2268	100

Amongst the teenage pregnancy cases only 12 (9.60 %) were our follow up while remaining 113 (90.40%) patients were referred from other institutes (Primary health centers, rural hospitals and subdistrict hospitals or private hospitals). In contrast to teenage pregnancies majority of the Non-Teenage patients were under our follow up (53.60%) while 58 (46.40%) patients were referred from outside. The difference was found to be **statistically significant (P<0.05)**.

Type of cases	Teenage Pregnancies		Non-Teenage Pregnancies	
	No. of Cases	Percentage	No. of Cases	Percentage
Follow Up	12	9.60%	67	53.60%
Referred	113	90.40%	58	46.40%
Total	125	100 %	125	100%

P < 0.05 (Significant)

Age groups analysis showed 124 (99.20%) patients belonged to 16-19 years of age whereas only 1 (0.80%) patients was of 15 years. Amongst Non-Teenage pregnancies 84 (67.20%) patients belonged to age group of 20-30 years whereas 41 (32.80%) patients were above 30 years of age. The mean age of the patients in teenage and non-teenage pregnancies group was found to be 18.5 +/- 0.66 years and 28.48 +/- 4.41 years respectively. The difference in the mean age of the patients was found to be **statistically significant (P < 0.0001)**. Majority of the patients in teenage group were of 19 years (57.60%).

Age group in years	Teenage Pregnancies		Non- Teenage Pregnancies	
	No. of cases	Mean age (yrs)	No. of cases	Mean age (yrs)
15 years & below	1	0.80%	0	0.00%
16- 19 years	124	99.20%	0	0.00%
20-30 years	0	0.00%	84	67.20%
Above 30years	0	0.00%	41	32.80%
Total	125	100 %	125	100%
Mean Age	18.5 +/- 0.66		28.48 +/- 4.41	

P < 0.0001 (Significant)

95% CI= 9.1945 to 10.7655

In our study, 3 teenagers (2.40%) were unmarried while remaining 122 (97.60%) were married. There was no unmarried pregnant woman in Non-Teenage pregnancy group. These findings highlight the practice of teenage marriages in our country, especially in low socio-economic group with 60.80% of lower class followed by 30.40% of lower middle class and 8.80% of middle class). as shown in the table.

Out of the 125 patients with teenage pregnancies anemia was seen in 51 (40.80%) patients whereas PIH and thrombocytopenia was seen in 8 (7.20%) and 1 (0.80%) patients respectively. In cases of Non-Teenage pregnancies anemia and gestational diabetes was seen in 30 (24%) and 2 (1.60%) patients respectively. Thrombocytopenia (1.60%), Systemic lupus erythematosus (0.80%) and Rh negative blood group (0.80%) were uncommon comorbidities in Non-Teenage pregnancies. The incidence of PIH and gestational diabetes was found to be comparable in both the groups (P>0.05). Only anemia was found to be higher in teenage pregnancies as compared to non-teenage pregnancies and the difference was found to be **statistically highly significant (P < 0.0001)**.

Risk Factors	Teenage Pregnancies		Clear Liquor		P-Value
	No. of Cases	Percentage	No. of Cases	Percentage	
Anemia	51	40.80%	30	24.00%	<0.0001 (Significant)

Gestational Diabetes	0	17.60%	2	1.60%	>0.05
PIH	8	7.20%	4	0.80%	>0.05
Thrombocytopenia	1	0.80%	2	1.60%	>0.05
Rh Negative Mother	1	0.00%	1	0.80%	>0.05
SLE	0	0.00%	1	0.80%	>0.05
HIV, HBsAg, VDRL	0	0.00%	0	0.00%	>0.05

The analysis of studied cases on the basis of mode of delivery showed that in teenage pregnancy group 96 (76.80%) had vaginal delivery whereas emergency and elective LSCS was done in 23 (18.40%) and 4 (3.20%) patients respectively. In Non-Teenage pregnancies 64 (51.20%) patients delivered vaginally and Emergency and Elective LSCS was done in 23 (18.40%) and 36 (28.80%) patients respectively. The analysis of need for cesarean section in both the groups showed that LSCS for fetal distress was done in 12 (10.40%) and 22 (17.60%) patients in teenage and non-teenage respectively. In teenage pregnancies the other causes of LSCS included cephalopelvic disproportion (3.20%), failed induction (1.60%), non-progression (1.60%) and patient request (1.60%). In Non-Teenage pregnancies after fetal distress patient request (12%), PROM (4.80%) and failed induction (4%) were the common causes of LSCS. The LSCS rate was found to be higher in Non-Teenage pregnancies as compared to teenage pregnancies and the difference was found to be **statistically significant (P<0.0001)**.

Indication For LSCS	Teenage Pregnancies		Non Teenage Pregnancies	
	No of Cases	Percentage	No of Cases	Percentage
Failed Induction	2	1.60%	5	4.00%
Non-Progress Of Labour	2	1.60%	1	0.80%
Fetal Distress	12	9.60%	22	17.60%
Cephalopelvic Disproportion	4	3.20%	0	0.00%
Placenta Previa	0	0.00%	2	1.60%
Abruptio Placenta	0	0.00%	1	0.80%
Patient request	2	1.60%	15	12.00%
Cord Prolapse	0	0.00%	0	0.00%
Multiple Pregnancy	0	0.00%	0	0.00%
Breech Presentation	1	0.80%	1	0.80%
Transverse Lie	1	0.80%	1	0.80%
PROM	1	0.80%	6	4.80%
Severe PreEclampsia	2	1.60%	4	3.20%
Gestational Diabetes	0	0.00%	1	0.80%
Total	27	21.60%	59	47.20%

The analysis of cases on the basis of complications during present pregnancy showed that the most common single complication in teenage pregnancies was found to be preterm deliveries which was seen in 15 (12%) patients followed by fetal distress (10.40%) Pre-Eclampsia (6.40%) and PROM (4.80%). Amongst non-teenage pregnancies the common complications seen were fetal distress (17.60%), PROM (8.80%). The complication rates were found to be comparable amongst both the groups with no significant difference in the incidence of any complication (P>0.05).

Amongst the teenage pregnancy cases 8 (6.40%) patients developed postpartum hemorrhage where as in amongst patients with Non-Teenage pregnancies 1 (0.80%) patients developed postpartum hemorrhage. The incidence of PPH was found to be high in teenage pregnancies as compared to non-teenage pregnancies and the difference was found to be **statistically significant (P=0.0357)**.

Type of cases	Teenage Pregnancies		Non-Teenage Pregnancies	
	No of Cases	Percentage	No of Cases	Percentage
PPH	8	6.40%	1	0.80%
NO PPH	117	93.60%	124	99.20%

The comparison of the neonates on the basis of incidence of low birth weight (LBW) showed that more LBW babies were born to teenage mother as compared to non-teenage pregnancies and the difference was found to be **statistically significant (P<0.05)**.

Birth weight	Teenage Pregnancies		Non-Teenage Pregnancies	
	No of patients	Percentage	No of patients	Percentage
Normal birth weight (≥ 2.5 kg)	92	73.60%	106	84.80%
Extremely low birth weight (< 1 Kg)	0	0.00%	0	0.00%
Very Low Birth Weight (1-1.5 kg)	3	2.40%	1	0.80%
Low Birth Weight (1.51- 2.5 kg)	30	24.00%	18	14.40%
Total	125	100.00%	125	100.00%

23 Neonates born to teenage mothers needed some form of resuscitative measures including endotracheal intubation and IPPV (1.60 %), intubation and suctioning (3.20%) , Bag and mask ventilation (5.60%) and Oxygen inhalation (8.00%). In babies born to Non-Teenage mothers 8 neonates required either oxygen inhalation or some form of resuscitation. The analysis of newborns who required some or the other form of resuscitation showed that in both the groups the difference was found to be **statistically significant (P<0.05)**.

	Oxygen/Resuscitation Required	No Resuscitation/ Oxygen Required	Total
Teenage Pregnancies	23	102	125
Non-Teenage Pregnancies	8	117	125
Total	31	219	250
Statistically Significant Difference in need for resuscitation (P=0.0065)			

The analysis of need for newborn babies requiring admission to NICU showed that amongst teenage pregnancies there were 27 (21.60%) neonates who required admission in NICU whereas amongst Non-Teenage pregnancies 15 (12.00%) babies required admissions in NICU. The difference in admission rates in NICU was found to be **statistically significant (P=0.042)**.

Indication for NICU Admissions	Teenage Pregnancies		Non-Teenage Pregnancies		P Value
	No of Patients	Percentage	No of Patients	Percentage	
Asphyxia	4	3.20%	2	1.60%	0.6837
Preterm/ Low birth weight care	5	4.00%	8	6.40%	0.5706
Respiratory Distress	12	9.60%	4	3.20%	0.06
Transient Tachypnea of Newborn	6	4.80%	1	0.80%	0.11
Total	27	21.60%	15	12.00%	

There was 1(One) neonatal mortality due to hypoxic Ischemic Encephalopathy in teenage pregnancies. The overall neonatal mortality in Teenage and Non-Teenage group was found to be 0.80 % and 0.00% respectively.

DISCUSSION:

Our incidence of teenage pregnancies of 5.51% are almost the double of those reported by Kappeler EM et al⁵ (2.65%) and Rajoriya M et al⁶ (2.1%), which may have been due to the high number of patients been referred to us (90.4%). The mean age of studied cases was found to be 18.5 years, which is similar to the mean age of cases reported by Masoumi SZ et al⁷ (17.3 years) and DG Scolov et al⁸ (17.81 years).

We found that teenage pregnancy rate was high in individuals belonging to lower socioeconomic classes. Various authors from developed as well as developing world showed that poverty and low socioeconomic status is an important risk factor for teenage pregnancy. Soumni G et al⁹ and Markovitz BP¹⁰ et al have concluded that low socioeconomic status does have a positive association with the risk of teenage pregnancies. In the context of our country where majority of the teenage pregnancies are occurring in married teenage girls this can be explained due to the fact the teenage marriages are more likely to occur in families with low socioeconomic status.

Analysis of cases on the basis of presence of co-morbidities showed

that the incidence of anemia was more in teenage pregnancies as compared to adult pregnancies and the difference was found to be statistically highly significant (P<0.0001). The incidence of anemia in our study was found to be similar to the incidence of anemia reported by Pinho-Pompeu M et al¹¹ who found the incidence of anemia in teenage pregnancies to be 41.2%. Other authors such as Shrivage JC¹² et al have found a higher percentage of teenage pregnancies to be having anemia (84.2%). Other authors such as Pal Amitha et al¹³ (27.5%) and Rajoriya M et al⁶ (29%) have reported relatively low incidence of anemia in their study. However, analysing co morbidities we found a relatively low incidence of pregnancy induced hypertension of 7.20%, whereas Shaikh S et al¹⁴ and Parra-Pingel PE et al¹⁵ have reported the incidence of PIH in teenage pregnancies to be 15% and 27.4% respectively and a still higher incidence of PIH was reported by Saxena P et al¹⁶ who reported that PIH was present in 27.4% of teenage pregnancies.

Majority of our patients (76.80%) delivered vaginally, Verma et al and Tyrberg et al also have reported that approximately 82.50% and 83.90% had normal vaginal delivery. Those who has Cesarean deliveries, fetal distress which was seen in 9.60% cases and the other indication for LSCS were cephalopelvic disproportion (3.20%), pregnancy induced hypertension (1.60%) and failed induction (1.60%). Similar to our study Gazala Y et al¹⁷ also reported that fetal distress was the most common indication for LSCS in teenage pregnancies which was seen in 50.70% of the studied cases. The other common indications reported by the authors were CPD (7.04%), PIH (2.01%) and failed induction (2.01%). In contrast to our study and the study conducted by Gazala Y et al¹⁷ the authors such as Rita D et al¹⁸ have reported CPD to be the most common indication for LSCS which was seen in 2/3rd of the studied cases in the study conducted by them. The other indications for LSCS as reported by the authors were PIH (12%), fetal distress (9.4%) and failed induction (1.5%). We had a very low instrumental deliveries (Forceps or vacuum extraction) for various indication of 1.60% as compared to authors such as Mesleh et al¹⁹ and Abu Hejja²⁰ having reported rates of instrumental deliveries to be 5% and 9% respectively.

The analysis of the cases on the basis of complications seen in the studied cases showed that 12% of the teenage pregnancies resulted into preterm birth. Complications such as fetal distress, pre-eclampsia and Premature rupture of membranes was seen in 10.4%, 6.4% and 4.8% patients. A study conducted by Rajoriya M⁶ showed that approximately 13% of the teenage pregnancies resulted into preterm deliveries. On the other hand the authors such as Ezegwui HU et al²¹ and Dos Santos GH²² reported that 18.9% and 28.5% of teenage pregnancies resulted into preterm deliveries.

Study	Complication	Percentage
Nair A et al ²⁰	Preterm Deliveries	18.22 %
	Fetal distress	6.69 %
	Preeclampsia	14.87 %
	PROM	6.50 %
Gazala Y et al ¹⁸	Preterm Deliveries	27.45 %
	Fetal distress	9.24 %
	preeclampsia	20.17 %
	PROM	18.21 %
Present study	Preterm Deliveries	12%
	Fetal distress	10.4%
	Preeclampsia	6.4%
	PROM	4.8%

We found that 26.40% of the studied cases delivered babies had low birth weight (< 2.5 kg), in contrast to this Shrivage JC et al²² and Rajoriya M et al⁶ have reported low birth weight babies to be 71.42% and 52% respectively. Admission in NICU showed that respiratory distress syndrome was seen in 9.6% cases. The other morbidities for which babies born to teenage mothers were admitted in NICU included transient tachypnea of newborn (4.80%), preterm /low birth weight care (4%) and birth asphyxia (3.2%). Similarly Mundhe et al reported the incidence of respiratory distress syndrome in the neonates born to teenage mothers to be 11.3% which was similar to our study. The other morbidities for which neonates required NICU admission as reported by Mundhe et al included prematurity and low birth weight (54%) , meconium aspiration syndrome (11.3%) and congenital anomalies (1.9%). Similarly Kawatika et al found prematurity or low birth weight babies as the most common indication for Admission in NICU.

From this study we can conclude that teenage pregnancies is an

important cause of maternal as well as perinatal morbidity and mortality. The problem is more prevalent in rural areas and in families belonging to low socioeconomic status. Unlike in developed countries teenage pregnancies in India are due to early marriage and such teenage mothers usually do not have a supportive family system. The usual causes of maternal morbidity such as anemia, pregnancy induced hypertension and chances of operative interventions are seen more frequently and with increased severity in teenage pregnancies. . Post partum hemorrhage was found to be statistically significantly higher in teenage pregnancies group. More incidence of anemia along with increased risk of PPH makes management of these patients difficult at places where facilities for blood transfusion are absent.

Neonates born to teenage mothers were found more likely to be of low birth weight as compared to non-teenage mothers and more likely to need some or the other form of resuscitation. This makes it imperative that pregnant teenage girls should be delivered at a place where NICU facilities are available.

Reduction in teenage pregnancies can be achieved through education, awareness programs, sex education and free and easy access to effective contraception. Since in our country majority of the teenage pregnancies are result of early marriage, strict implementation of law which prohibits child marriage can be another effective measure to reduce teenage pregnancy rates. Pregnancy at appropriate age is essential for improving physical and mental well-being of pregnant women which consequently will have a positive effect on health and well-being of newborn.

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