**INTRODUCTION**

Adolescence is the transition period from childhood to adulthood. It is defined by the World Health Organization as period between 10 and 19 years of age. This age represents an important stage for ensuring a successful transition to adulthood. Recently, with changing socio-demographic landscape of India, teenage pregnancy has become an important public health issue. This issue is not unique to developing countries as even developed countries are dealing with this situation. Recent data estimates that about 60 million women were married before the age of 18 years and approximately 16 million women aged 15-19 years old give birth to a child. India being a young nation, has the highest proportion of adolescents. Therefore, teenage pregnancies are going to be an important issue in years to come.

Studies conducted in Taiwan, USA, and Korea showed that teenagers were 1.58, 1.36, and 1.16 times more likely to have preterm delivery than the adults, respectively. Studies conducted in Taiwan, USA, and Korea showed that teenagers were 1.58, 1.36, and 1.16 times more likely to have preterm delivery than the adults, respectively. Numerous social determinants causing teenage pregnancy include lack of education in general and on sex education,
which result in poor health seeking behaviour and thus very abysmal utilization of health services like contraceptives, and abortion services. Therefore, the incidence and outcomes of teenage pregnancies can vary with the geographical location. The present study was conducted to assess the incidence of teenage pregnancy in Berhampur, Odisha and various maternal and neonatal outcomes of these pregnancies.

RESULTS

Of the total 14100 pregnancies at our institution during the study period, 564 were teen pregnancies, (incidence 4%). Table 1 describes the baseline characteristics of the study participants. It was observed that mean age was 18.7 years, 81.2% were primigravida 79% belonged to low socioeconomic status, 67.2% were from rural area and 97.7% were married. The various maternal complications are as described in Table 2. There were 214 anaemic mothers, 58% had mild anaemia, 40% had moderate and 2% had severe anaemia (Table 3). Pregnancy induced hypertension (PIH) was diagnosed in 74 cases, of which 40.5% had mild PIH, 37.83% had severe PIH and 21.63% had eclampsia. Of the 129 cases who had preterm labour, 79.06% had late preterm but had good neonatal outcome and 16 cases had very preterm delivery. The caesarean section rate was performed in 51.9%, 38.12% had normal vaginal delivery, 45 of them needed instrumental delivery and 11 had assisted breech delivery. The most common indications for caesarean section were fetal distress (36.2%) and cephalopelvic disproportion (24.6%). Of the 271 vaginal deliveries, 83 delivered within 6 hrs of duration, 181 of them delivered within 6-10 hrs and 7 of them took more than 10 hrs.

Table 1. Baseline characteristics of the study participants.

| Variables               | Number | Percentage (%) |
|-------------------------|--------|----------------|
| Age (years)             |        |                |
| 17                      | 22     | 4              |
| 18                      | 113    | 20             |
| 19                      | 429    | 76             |
| Parity                  |        |                |
| Primipara               | 458    | 81.20          |
| Multipara               | 106    | 18.80          |
| Registration status     |        |                |
| Un-booked               | 360    | 63.85          |
| Booked                  | 204    | 36.17          |
| Socioeconomic status    |        |                |
| Low                     | 445    | 79             |
| Middle                  | 119    | 21             |
| High                    | 0      | 0              |
| Education status        |        |                |
| Illiterate              | 112    | 20             |
| Primary education       | 305    | 54             |
| High school             | 119    | 21             |
| College                 | 28     | 5              |
| Residence               |        |                |
| Rural                   | 379    | 67.20          |
| Urban                   | 185    | 32.80          |
| Marital status          |        |                |
| Married                 | 551    | 97.70          |
| Unmarried               | 13     | 2.30           |

Of the 575 cases, 553 were live births, of which 11 died in the perinatal period, 16 were intrauterine death, 6 babies were still born and there were no congenital...
anomalies in any babies (Table 4). Of the 553 live births, 1.04% of them weighed <1.5 kg, 29.16% weighed 1.5 till 2.5 kg, 65.5% weighed between 2.5 to 3.5 kg and 5.2% weighed >3.5 kg. NICU admission was required for 26.9% of the neonates and the most common complication was neonatal jaundice, which was observed in 14.3%.

**DISCUSSION**

Teenage pregnancy remains major public and social health issue in India due to prevailing social preferences, old traditions and poor access to health care in remote rural areas. Lack of education deprives teenagers of the knowledge about family planning, leading to early pregnancy. We observed the incidence of teenage pregnancy to be 4% at our hospital. Majority of the study participants of our study were from low socioeconomic strata (79% belonged to low socioeconomic status and 67.2% were from rural area). Devi et al reported the incidence of teenage pregnancy to be 5.56%.

Okram and colleagues also found anemia to be the most common complication. Generally, the cause of anaemia is poor eating habits which is common in adolescents. Pregnancies (47%) inadequate nutritionist often reported the incidence of anemia among those with teenage pregnancies (47%).

We observed 38% of the study participants to be anemic. Comparing with adult pregnancies, Devi et al found a higher prevalence of anemia among those with teenage pregnancies (47%). We observed 38% of the study participants to be anemic. However, the anemia prevalence is higher in adolescents. This can be attributed to lack of awareness about the importance of preconception care and poor health-seeking behavior.

| Anemia (n=214, Hb in g/dl) | Number | %  |
|---------------------------|--------|----|
| Mild (10-10.9)            | 124    | 58 |
| Moderate (9.9-7)          | 86     | 40 |
| Severe (6.9-4)            | 4      | 2  |
| Very severe (<4)          | 0      | 0  |

| Pregnancy induced hypertension (n=74) | Number | %  |
|--------------------------------------|--------|----|
| Mild                                 | 30     | 40.54 |
| Severe                               | 28     | 37.83 |
| Eclampsia                            | 16     | 21.63 |

| Preterm labor (n=129)                |        |    |
|--------------------------------------|--------|----|
| Extremely preterm (<28 weeks)        | 0      | 0  |
| Very preterm                         | 16     | 12.40 |
| Early preterm                        | 11     | 8.53 |
| Late preterm                         | 102    | 79.06 |

| Mode of delivery (n=564)              |        |    |
|---------------------------------------|--------|----|
| Caesarean section                     | 293    | 51.95 |
| Normal vaginal delivery               | 215    | 38.12 |
| Forceps delivery                      | 23     | 4.08 |
| Ventouse delivery                     | 22     | 3.90 |
| Assisted breech                       | 11     | 1.95 |

| Duration of labor (n=271) (hours)     |        |    |
|---------------------------------------|--------|----|
| <6                                    | 83     | 30.80 |
| 6-10                                  | 181    | 66.66 |
| >10                                   | 7      | 2.54 |

| Variables                              | Number | %  |
|----------------------------------------|--------|----|
| Fetal outcome (n=575)                  |        |    |
| Total live births                      | 542    | 94.20 |
| Still born                             | 6      | 1   |
| Perinatal death                        | 11     | 2   |
| IUFD                                   | 16     | 2.80 |
| Congenital anomalies                   | 0      | 0   |
| Birth weight (n=553) (kg)              |        |    |
| <1.5                                   | 6      | 1.04 |
| 1.5-2.5                                | 161    | 29.16 |
| 2.5-3.5                                | 357    | 64.58 |
| >3.5                                   | 29     | 5.20 |
| NICU admission (n=553)                 |        |    |
| Yes                                    | 149    | 26.95 |
| No                                     | 404    | 73.05 |
| Neonatal complications (n=553)         |        |    |
| Neonatal jaundice                      | 79     | 14.30 |
| Early onset sepsis                     | 35     | 6.30 |
| Respiratory illness - TTNB/HMD/MAS     | 30     | 5.40 |
| Necrotizing enterocolitis              | 10     | 1.80 |
| Hypoxic ischemic encephalopathy        | 8      | 1.40 |
| Neonatal seizures                     | 7      | 1.20 |

**Table 2: Maternal complications.**

| Maternal complications                  | Number | %  |
|-----------------------------------------|--------|----|
| Anaemia                                 | 214    | 38 |
| Preterm labour                          | 129    | 23 |
| Fetal distress                          | 124    | 22 |
| Cephalopelvic disproportion             | 84     | 15 |
| Pregnancy induced hypertension          | 74     | 13 |
| Oligohydramnios                         | 73     | 13 |
| PROM                                    | 73     | 13 |
| Post-dated pregnancy                    | 40     | 7  |
| Malpresentation                         | 22     | 4  |
| Intrauterine growth retardation         | 16     | 3  |
| Intrauterine fetal death                | 16     | 3  |
| Antepartum hemorrhage                   | 11     | 2  |
| Postpartum hemorrhage                   | 11     | 2  |
| Multiple gestation                      | 11     | 2  |
| Still birth                             | 6      | 1  |

**Table 3: Maternal outcomes in our study population.**

| Variables                              | Number | %  |
|----------------------------------------|--------|----|
| Table 4: Neonatal outcomes in the present study. |        |    |

| Variables                              | Number | %  |
|----------------------------------------|--------|----|
| Fetal outcome (n=575)                  |        |    |
| Total live births                      | 542    | 94.20 |
| Still born                             | 6      | 1   |
| Perinatal death                        | 11     | 2   |
| IUFD                                   | 16     | 2.80 |
| Congenital anomalies                   | 0      | 0   |
| Birth weight (n=553) (kg)              |        |    |
| <1.5                                   | 6      | 1.04 |
| 1.5-2.5                                | 161    | 29.16 |
| 2.5-3.5                                | 357    | 64.58 |
| >3.5                                   | 29     | 5.20 |
| NICU admission (n=553)                 |        |    |
| Yes                                    | 149    | 26.95 |
| No                                     | 404    | 73.05 |
| Neonatal complications (n=553)         |        |    |
| Neonatal jaundice                      | 79     | 14.30 |
| Early onset sepsis                     | 35     | 6.30 |
| Respiratory illness - TTNB/HMD/MAS     | 30     | 5.40 |
| Necrotizing enterocolitis              | 10     | 1.80 |
| Hypoxic ischemic encephalopathy        | 8      | 1.40 |
| Neonatal seizures                     | 7      | 1.20 |
caused by the nutritional deficiencies, especially iron and folic acid, and in low-income countries by malaria and hookworm infection. In a study by Mahavarkar et al, anaemia was also the most common complication seen. Severe anaemia leads to preterm labour, low birthweight, and related complications, postpartum hemorrhage and sepsis, in addition to impaired physical and cognitive development, and increased risk of morbidity in children and reduced work productivity in adults.

Many studies from many countries, comparing the risk of preterm in teenage versus adult pregnant women. Most of the studies found more preterm births in adolescents and made it clear that maternal age is an important independent factor. Preterm labor was observed in 23% of the study participants. Okram et al reported the rate of preterm to be 8%, which was similar to that of Althabe et al. Caesarean section rate was found to be 51.9% in our study. The most common indication for Caesarean section was fetal distress (36.2%) followed by cephalopelvic disproportion (24.6%). Similar observations were made by Rita and colleagues as well. Other indications for caesarean delivery in their study were pre-eclampsia and related complications (12%), fetal distress (9.4%), malpresentations and placental causes (3.7%) in our study. Okram and colleagues reported 31% caesarean rate.

In our study, 30% of the babies born to teenagers had low birth weight. The incidence of IUGR was 3% in the present study and NICU admission was required in 27% of the babies born. Rita D et al reported the incidence of low birth weight in 12%, NICU admission rate to be 8.4%, and perinatal mortality to be 2%. Thobbi et al reported the incidence of low birth weight to be 27.3% and it was the most common cause of perinatal mortality in teenage mothers in their study, which could be either due to prematurity or small for gestational age babies.

There are a few limitations of the study. Ours was a single centre study. As teenage pregnancy has numerous social determinants involved, the results of the present study may not be generalizable to other parts of India. Secondly, we did not compare the outcomes in teenage pregnancy with those of adult pregnancy, which limits our ability to comment on whether some adverse outcomes were associated with teenage pregnancy.

CONCLUSION

Teenage pregnancies represent a high-risk. The present study demonstrated the various maternal as well as neonatal complications in teenage pregnancies. This being a social issue, promotive and preventive measures at community level are required to help avoid teenage pregnancies. Those who experience teenage pregnancy should be given extra attention and care. Many of these complications are manageable, provided the access to services is available.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Park K. Park’s Textbook of Preventive and Social Medicine. 21st ed. Jabalpur, India: Banarasidas Bhanot. 2011;489-97.
2. Huang CC, Lin YC, Huang YT, Huang KH. Comparison of medical issues in antenatal and perinatal periods in early youth, adolescent, and young adult mothers in Taiwan: a 10-year nationwide study. BMC pregnancy and childbirth. 2014;14(1):260.
3. Lee SH, Lee SM, Lim NG, Kim HJ, Bae SH, Ock M et al. Differences in pregnancy outcomes, prenatal care utilization, and maternal complications between teenagers and adult women in Korea: a nationwide epidemiological study. Medicine. 2016;95(34).
4. Abebe AM, Fitie GW, Jenber DA, Reda MM, Wake GE. Teenage Pregnancy and Its Adverse Obstetric and Perinatal Outcomes at Lemlem Karl Hospital, Tigray, Ethiopia, 2018. Bio Med Res Int. 2020;2020.
5. Devi G, Kayalvizhi, Poovathi M. Study of fetomaternal outcome of teenage pregnancy in a tertiary care hospital-MGMGH. Int J Reprod Contracept Obstet Gynecol. 2019;8:303-7.
6. Rita D, Naik K, Desai RM, Tungal S. Study of feto maternal outcome of teenage pregnancy at tertiary care hospital. Int J Reprod Contracept Obstet Gynecol. 2017;6:2841-5.
7. Okram SD, Reddy KM, Samyukta BSCN, Sadvika P, Betha K. Prevalence of teenage pregnancy and pregnancy outcome at a rural teaching hospital in India. Int J Reprod Contracept Obstet Gynecol. 2019;8:613-6.
8. National Family Health Survey-4, Available from: http://rchiips.org/nfhs/pdf/NFHS4/India.pdf. Accessed January 18, 2021.
9. Mahavarkar SH, Madhu CK, Mule VD. A comparative study of teenage pregnancy. Am J Obstet Gynecol. 2008;28(6):604-7.
10. Althabe F, Moore JL, Gibbons L, Berrueta M, Goudar SS, Chomba E et al. Adverse maternal and perinatal outcomes in adolescent pregnancies: The Global Network’s Maternal Newborn Health Registry study. Reproduct Health. 2015;12(2):S8.

Cite this article as: Nepak A, Soren SN, Karjee AK. Maternal and neonatal outcomes in teenage pregnancy: an observational study from Odisha. Int J Reprod Contracept Obstet Gynecol 2021;10(3):xxx-xx.