



ORIGINAL RESEARCH

**Fetal outcome of adolescent pregnancy in a tertiary care center in western Nepal:
A case control study**

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Abstract

Background: The incidence of adolescent pregnancy is decreasing in developed countries, whereas developing countries like Nepal still report a high incidence.

Aims: To compare the fetal outcomes of adolescent pregnancies with those of the optimal reproductive age group in a country that accounts for 95% of teenage pregnancies, in contrast to 11% worldwide.

Method: A hospital-based case-control study was conducted with 150 pregnant women with singleton gestation admitted to Kathmandu University Hospital. An adolescent pregnancy (<19 yrs.) was considered a case, and pregnant women of the optimal age group (20-35 yrs.) were considered the control. The data were collected from Jan 5, 2018, to Jan 5, 2019. The control group was selected by matching the parity of the cases in the study groups during the same study period. Respondents were interviewed and examined with a pre-structured tool. Odds Ratio (OR) and 95% Confidence Interval (CI) were calculated using conditional logistic regression (P<0.05 considered significant).

Results: The mean age of adolescent mothers was 17 years, the majority being primigravida. This study identified that fetal complications were higher in adolescent pregnancies (61% vs. 40%). The fetal complications like low birth weight (OR 2.42, 95%CI :1.044-5.43, P=0.03), NICU admission (OR 3.27, 95%CI:1.48-7.25, P=0.003), low APGAR score (OR 2.32, 95%CI:1.05-5.11, P=0.034) and Neonatal Death (OR 3.72, 95%CI:1.15-12.01, P=0.04) were associated with the adolescent pregnancies respectively.

Conclusion: Adolescent pregnancies are at increased risk of fetal complications compared to pregnancies in the optimal reproductive group. Adolescent pregnancies were at increased risk of low birth weight, neonatal death, low APGAR score, and higher admission in NICU. Therefore, an adequate antenatal visiting program for early detection and timely management likely will reduce the fetal complications during adolescent pregnancy.

Keywords: *adolescent pregnancy, complications, Nepal.*

Conflicts of interest: None declared.

Introduction

Motherhood is a very precious moment in a woman's life. Maternal age remains an independent factor influencing obstetric outcomes. The biologically optimal childbearing age for a woman is between 20 and 35 years. Women at the extremes of reproductive age groups, i.e., below 20 years and above 35 years, are considered a risk factor for adverse obstetric outcomes (1). Adolescent pregnancy is defined as an adolescent girl becoming pregnant within the ages of 13-19 years (2). Teenage pregnancy is a significant social and public health problem worldwide. In developing countries, early marriages, traditional gender roles, lack of education, and poverty are the major factors contributing to adolescent pregnancy. In contrast, teenage pregnancy is usually seen out of marriage in developed countries. Young age at first intercourse, lack of use, or incorrect use of contraceptive methods are the factors resulting in a pregnancy in adolescence (3,4). Worldwide, adolescent pregnancy rates range from 143 per thousand in some Sub-Saharan African countries to 2.9 per thousand in South Korea (5). According to a report published by WHO in 2008, about 16 million adolescent girls aged 15-19 years give birth each year, representing 11% of all deliveries worldwide, and almost 95% of these births occur in developing countries. Moreover, it is estimated that half of the adolescent births occur in just seven countries: Bangladesh, Brazil, the Democratic Republic of Congo, Ethiopia, Nigeria, India, and the United States (6). Within South Asia, the recorded adolescent pregnancy is highest in Bangladesh (35%) followed by Nepal (21%) and India (21%) (7). However, with proper sexual education programs and increasing rates of contraception use, there is a decreasing trend towards adolescent pregnancy rates. According to Demographic Health Surveys, adolescent pregnancy rates have fallen in 35 out of 40 countries since 2000. This range varies from an average decline of 16% in Eastern and Southern Africa to 50% in North Africa, West Asia, and Europe (8).

Methods

This hospital-based, observational, case-control study was undertaken in Kathmandu University Hospital, Nepal. The sample size considered for this study was 150, including the study and control groups.

All pregnant women with a singleton pregnancy, below 20 years, and fulfilling inclusion and exclusion criteria were enrolled in this study from the admission room. They were considered as the study group. For each study group, there was a separate control group which was taken from the age group 20-34 years, meeting the inclusion and exclusion criteria. In each group, parity was matched. After enrolling a case in the study group, the subsequent first case with matched parity was taken for comparison. The time of admission of each case was recorded. However, if any patient in either group was discharged without being delivered, lost to follow up, or missing medical records, this woman and her control were excluded from the study. Only the patients who freely consented to participate were enrolled and interviewed on admission. Data collection: At admission, baseline information regarding age, address, ethnicity, religion, education level, gravidity, and detailed medical and surgical history, obstetric and menstrual history was recorded in a proforma after taking verbal and written consent. Maternal age was ascertained by the patient's account of her age at marriage and age at first childbirth. The Last Menstrual Period (LMP) and regularity of the previous menstrual cycle were asked regarding menstrual history. Gestational age was calculated from the LMP if the patient was sure of her date and her previous cycles were regular. Suppose the patient does not remember her LMP, we used the earliest available ultrasound reports. All the patients were examined, and relevant investigations were sent. Every case was followed thereafter. The delivery was attended, and for those cases whose delivery could not be attended, the details were obtained from the records. The neonates were assessed: The fetal outcome was recorded in terms of APGAR Score¹ at 1 minute and 5

minutes, birth weight, neonatal deaths, and admission in Neonatal Intensive Care Unit (NICU) stay and its indications. All the enrolled cases were followed up regularly throughout the hospital stay. These patients were discharged according to the hospital protocol. At discharge, every patient and their neonates were examined, counseled regarding family planning, breastfeeding, and immunization of the newborn. Data Entry and Analysis: Data were entered into a Microsoft Excel spreadsheet. Data analysis was made using the Statistical Package for the Social Sciences (SPSS-21) and was

depicted in tables. Odds Ratio and its 95% CI was calculated by using conditional logistic regression. A P-value of <0.05 was considered significant. During the study period, 150 cases were enrolled, 75 as case (≤ 19 years) and 75 as controls. (20-34 years). Parity was matched for each patient.

Results

Table 1 shows the age of adolescent mothers ranged from 15 to 19 years with a mean age of 17.29 ± 1.19 . The women in the control group had a mean age of 26 ± 4.76 years.

Table 1. Mean, maximum, minimum, and median age of case and control groups

| | Mean \pm SD | Max | Min | Median |
|---------------------|------------------|-----|-----|--------|
| Adolescent Pregnant | 17.29 \pm 1.19 | 19 | 15 | 17 |
| ORAG | 26 \pm 4.76 | 34 | 20 | 27 |

In this study, 25 teens (33%) were illiterate, 28 (37.3%) had completed the primary level of education, and 22 teens (29.3%) had completed the secondary level of education. In the control group, 40% had completed primary level of education, while 29.3% were illiterate. Similarly, 50 teens were housewives (66.7%),

while only 6 were students. In the control group, 54.7% were housewife while 5.3% was a student. Thus, in both the case and control group majority was a housewife, and the minorities were students, and the results were not statistically significant.

Table 2. Demographic and menstrual characteristics of the study population

| Characteristics | Adolescent Pregnancy n (%) | ORAG n (%) | P-value* |
|-----------------|----------------------------|------------|----------|
| Age | < Median (17) | 18 (24%) | <0.001* |
| | \geq Median (17) | 57 (76%) | |
| | < Median (27) | 36 (48%) | |
| | \geq Median (27) | 39 (52%) | |
| Education Level | Illiterate | 25 (33%) | 0.915 |
| | Primary Level | 28(37.3%) | |
| | Secondary level | 22 (29.3%) | |
| Occupation | Housewife | 50 (66.7%) | 0.237 |
| | Service | 9 (12%) | |
| | Student | 6 (8%) | |
| | No Job | 10 (13.3%) | |
| Menstrual cycle | Irregular | 19 (25.3%) | 0.85 |
| | Regular | 56 (74.7%) | |

* P-value highly significant at the level < 0.001

This study identified that fetal complications were higher in adolescent pregnancy (61% Vs 40%). The fetal complications like low birth weight (OR 2.42, 95% CI:1.044-5.43, $P=0.03$), NICU admission (OR 3.27, 95%CI:1.48-7.25,

$P=0.003$), low APGAR score (OR 2.32, 95%CI:1.05-5.11, $P=0.034$) and Neonatal Death (OR 3.72, 95%CI:1.15-12.01, $P=0.04$) were associated with the adolescent pregnancies respectively.

Table 3. Fetal Outcomes between Teen Pregnancy and ORAG Pregnancy

| Complications | Adolescent pregnancy (n) | ORAG (n) | OR | P-value |
|-------------------------|--------------------------|-------------|-------------------|---------|
| Low Birth Weight | 22 (29.30%) | 11 (14.70%) | 2.42 (1.07-5.43) | 0.03* |
| APGAR at 5 min ≤ 6 | 23 (30.70%) | 12 (16%) | 2.32 (1.05-5.11) | 0.034* |
| NICU Admission | 27 (36%) | 11 (14.70%) | 3.27 (1.48-7.25) | 0.003* |
| Neonatal Death | 16 (21.40%) | 7 (9.30%) | 3.72 (1.15-12.01) | 0.041* |

* P-value statistically was significant at the level < 0.05 . NICU=Neonatal ICU

Discussion

Adolescent pregnancy is an important global health issue in developing and developed countries due to their physiological and anatomical immaturity and various socioeconomic barriers. Although multiple studies have shown different results, most have demonstrated an increased frequency of adverse pregnancy complications in adolescent pregnancy, resulting in a less favorable maternal and fetal outcome. In this study, most of the adolescent mothers, i.e. 54% were primipara and 13% with previous one viable pregnancy; clearly, this is due to the young age of adolescent mothers. Several studies have shown that birth asphyxia results in low APGAR scores in the newborns of adolescent mothers. Mukhobadhya et al. (9) and Kumar et al. (10) reported a significantly higher rate of birth asphyxia in newborns of adolescent mothers. Similarly, higher rates of low APGAR score in infants of adolescent mothers as shown in retrospective studies indicated birth asphyxia as one of the complications associated with adolescent pregnancy (11,12). In this study, the overall incidence of low birth weight of adolescent mothers was 22% which was significantly higher than in the control group (11%) with a p-value of 0.03. When further stratified into preterm and term, Low Birth Weight (LBW) babies showed that most of the LBW was due to preterm births associated with adolescent pregnancy.

This result is consistent with various other studies. Two large population-based studies conducted in Ireland and the United States revealed a strong association between young maternal age and the rate of LBW infants (13,14). Similarly, studies performed by Cy et al. in Hongkong (11), Aquino-Cunha et al. in Brazil (15), and Chutadip Tantayakom et al. in Thailand (16) found that adolescent mothers were about 1.7-2.99 times at increased risk of delivering an LBW infant as compared to the reference population. Chutadip Tantayakom et al. (16) showed that the rate further increased in young adolescents by up to 3.98 times (16). This study showed that about 27% of the neonates of adolescent mothers were admitted to NICU, which was significantly higher than 11% in the control population (P -value=3.27). The higher incidence of NICU admission was attributed to a greater incidence of prematurity and corresponding low birth weight associated with a higher death rate (16 vs. 7%).

Conclusion

Adolescent girls have a higher rate of medical and obstetric complications during pregnancy and a higher rate of neonatal complications: low birth weight due to prematurity and admission in NICU. This study concludes that pregnancy at adolescent age is at high risk and needs adequate antenatal visits for timely detection of risk factors and management to optimize the pregnancy outcome in this group.

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