

## ORIGINAL ARTICLE

## Adverse Reproductive Outcomes Associated With Teenage Pregnancy

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**ABSTRACT:** Introduction– It is debated whether teenage pregnancy is associated with an adverse reproductive outcome. This study assessed the reproductive outcomes in teenage pregnancy in Nepal, a developing setting.

Methods – A hospital based retrospective cohort study of 4,101 deliveries to compare the outcomes between teenage and non-teenage pregnancies.

Results – Pregnancy in teenagers was associated with significantly increased risk ( $P<0.05$ ) of delivery of very and moderately preterm births and Low Birth Weight babies. There was no significant difference in risk of having small for gestational age babies, low APGAR score at birth at 1 min and 5min, stillbirth, neonatal death, and post partum hemorrhage. However, the risk of having delivery by episiotomy, vacuum or forceps and Caesarean section was significantly lower ( $P<0.05$ ) among teenage mothers.

Conclusion – Teenage women were more likely to have preterm births and low birth weight babies. However, they were less likely to have delivery by episiotomy, forceps or vacuum and Caesarean sections. In other respects, there were no significant differences between teenage and non-teenage mothers.

**KEYWORDS:** Teenage; Pregnancy; Outcome; Preterm; Low Birth Weight; SGA; Caesarean

### INTRODUCTION

Teenage pregnancy is an important public health problem worldwide as it often occurs in the context of poor social support. It has been associated with maternal complications, premature birth, low birth weight, perinatal mortality and increased infant mortality [1]. It has also been observed that in developing countries, teenage mothers were at increased risk of maternal anemia, pre-term birth and Caesarean delivery [2]. Hence, the United Nations remarks that early child bearing is a high health risk for both the mother and the child [3].

In Nepal, a significant number of teenage women get married and bear children. However, they are not equally distributed across urban and rural areas and

exact data is not available [4]. Adolescents comprise 23 % of 23 millions of the Nepalese population [5]. The median age at first marriage for a woman in Nepal is 16.6 years, suggesting that the majority of newly married couples are teenagers [6]. Considering the social structure where women get pregnant within the first few years of their marriage, teenage pregnancy (<20 years) is common in Nepal. Teenage pregnancy with first Ante Natal Checkup (ANC) visit accounts for 15.5% of the total expected pregnancies [7]. According to the 1996 National Family Health Survey (NFHS), nearly half of all female adolescents were married in 1996 and over half of these were already mothers or were pregnant, as were 90% of married young adult women aged 20–24 [8].

The social structure, ante-natal care, perinatal care and the quality of services available in developing countries differ from that of developed countries. This study was conducted to determine whether teenage pregnancy is associated with adverse outcomes in a developing setting.

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## MATERIALS AND METHODS

### Design

A hospital based retrospective cohort study.

### Setting

Mahendra Adarsh Chikitsalaya, a 150 bed government hospital in Chitwan, Nepal.

### Data collection and selection criteria

The maternity discharge register was used to identify singleton births that resulted in a live or stillborn baby during the Nepali fiscal year 2062/63 (July 2005 to June 2006). Inclusion in the study group was restricted to maternal age between 15-29, Parity 0 or 1, birth weight >500gm and delivery at or after 28 weeks of gestation at birth. Only those cases fulfilling the above criteria and for which data on all variables were available were included. This study was ethically approved by the Hospital Administration, Mahendra Adarsha Chikitsalaya, Chitwan, Nepal.

### Comparison groups

Data collected from the cohort was stratified into teenage (15-19) and non-teenage (20-29) groups and outcomes were compared between these groups.

### Definitions and denominators

The age of pregnant woman in completed years at the time of birth of baby was considered as maternal age. Ethnicity and type of delivery was recorded as mentioned in the register. For simplicity, episiotomy with instrumental delivery was considered as instrumental delivery. Post Partum Hemorrhage (PPH) was defined as blood loss greater than 500 ml following birth of baby during the hospital stay.

Gestational age at birth was the age from the last menstrual period (LMP) in completed weeks. Parity 'zero' was births to women who had no previous childbirths or whose previous pregnancies had all ended in abortions. Parity 'one' was defined as births preceded by only one pregnancy that did not result in abortion. Small for gestational age (SGA) baby was a live baby who was less than 10th percentile of birth weight for the given week of gestation derived from Babson and Benda growth graphs [9]. Birth weight below 2,500 grams at birth irrespective of the gestational age was considered as Low Birth Weight (LBW).

Birth of a live baby at 28 to 32 weeks' gestation was considered as very pre-term delivery and that between 33 to 36 weeks as moderately pre-term delivery. APGAR score less than 7 was considered as low APGAR score at birth. Still birth was defined as delivery of a dead baby after 28 weeks of gestation while neonatal death referred to death of a live born

baby during the hospital stay of the mother.

For all outcomes, the denominator used was the total number of deliveries in their respective categories.

### Statistical analysis

Data entry and statistical analysis were performed using Epi Info 2002 (Centre for Disease Control and Prevention, USA). The adjusted odds ratios for maternal and fetal outcomes were calculated by logistic regression analysis. Since the outcomes have been known to vary between different ethnic groups within Nepal [10] and also with parity [11], all logistic regression analysis included ethnic group and parity as dummy variables. Additional confounding factors, including logistic regression models for each outcome, have been mentioned in their respective tables.

## RESULTS

Of the 5,076 deliveries recorded in the maternity register during the Nepali fiscal year 2062/063 in Mahendra Adarsha Chikitsalaya, 80.79% (n=4,101) satisfied our inclusion criteria. Of these 19.27% (n=790) were in the 15-19 age group and 80.73% (n=3,311) were in the 20-29 age group. The population characteristics are shown in Table 1.

Teenage mothers had a significantly increased incidence of delivery of very preterm babies (OR, 3.02; 95% CI, 1.61-5.66; P<0.001), moderately preterm babies (OR, 1.59; 95% CI, 1.14-2.20; P<0.05) and Low Birth Weight babies (OR, 1.54; 95% CI, 1.18-2.02; P<0.05). The risk of having small for gestational age babies (OR, 1.03; 95% CI, 0.83-1.27), low APGAR score at birth at 1 min (OR, 1.07; 95% CI, 0.82-1.38), and 5 min (OR, 1.19; 95% CI, 0.56-2.53), stillbirth (OR, 1.43; 95% CI, 0.81-2.52) and neonatal death (OR, 2.04; 95% CI, 0.70-5.89) was also higher in the teenage group, although these were not statistically significant (Table 2).

Among the maternal outcomes (Table 3), the risk of having delivery by episiotomy (OR, 0.76; 95% CI, 0.60-0.96; P<0.05), vacuum or forceps (OR, 0.67; 95%

	Total (%)	Women aged 15-19 (%)	Women aged 20-29 (%)	P-value
Total	4,101 (100)	790 (100)	3,311 (100)	
Mean age $\pm$ S.D	21.91 $\pm$ 2.76	18.15 $\pm$ 0.90	22.81 $\pm$ 2.25	<0.001
Ethnicity				
Brahmin/Chhetri	2,328 (56.76)	328 (41.51)	2,000 (60.40)	
Newars	255 (06.21)	45 (05.69)	210 (06.34)	
Mongolians	680 (16.58)	160 (20.25)	520 (15.70)	
Others	838 (20.43)	257 (32.53)	581 (17.54)	
Parity				
Zero	2744 (66.91)	726 (91.89)	2018 (60.94)	
One	1357 (33.09)	64 (08.10)	1293 (39.05)	

Table 1: Study Group Demographics

	Women aged 15-19 (%) (n=790)	Women aged 20-29 (%) (n=3,311)	Odds Ratio (95% CI)	P-Value
Weeks of Gestation				
Very Preterm	21 (02.65)	29 (00.87)	3.02 (1.61-5.66)	<0.001
Mod. Preterm	63 (07.97)	164 (04.95)	1.59(1.14-2.20)	<0.05
Low Birth Weight	83 (10.50)	212 (06.40)	1.54 (1.18-2.02)	<0.05
Small for Gestational Age	143 (18.10)	521 (15.73)	1.03 (0.83-1.27)	NS,0.78
Low APGAR score*				
1 min	92 (11.64)	313 (09.45)	1.07 (0.82-1.38)	NS,0.60
5 min	11 (01.39)	27 (00.81)	1.19 (0.56-2.53)	NS,0.64
Still Birth	19 (02.40)	49 (01.47)	1.43 (0.81-2.52)	NS,0.21
Neonatal Death	6 (00.75)	12 (00.36)	2.04 (0.70-5.89)	NS,0.18

**Table 2:** Fetal Outcomes

CI = Confidence Interval, NS = Not Significant Logistic regression analyses included ethnic group and parity.

\* Weeks of Gestation (Additional confounding factor in logistic regression model)

CI, 0.46-0.97;  $P < 0.05$ ) and Caesarean section (OR, 0.69; 95% CI, 0.51-0.91;  $P < 0.05$ ) was significantly lower among teenage mothers. The risk of developing Post Partum Hemorrhage was not significantly different between the two groups (OR, 1.15; 95% CI, 0.59-2.21).

## DISCUSSION

This study shows that teenage pregnancy is associated with preterm delivery and low birth weight babies. Many previous studies have shown similar findings [12-14]. In contrast to these studies, we did not find an association between teenage pregnancy and delivery of small for gestational age babies. Also the high proportion of small for gestational age babies seen in both teenage and non-teenage age groups may be due to the use of Babson and Benda growth chart which is based on a different population [9].

It is often argued that the adverse reproductive outcome in teenage pregnancy is due to the social, economic and behavioural factors rather the biological effect of young age [15-17]. One earlier study has shown that significant differences in the socioeconomic status between teenage mothers and older mothers exist in Nepal as well [18]. The weight of the mother also plays an important role in outcomes such as small for gestational age [19]. We have not taken account of

socioeconomic factors or maternal weight which is one of the major limitations of our study.

Teenage mothers have been shown to more likely be unmarried and smokers which adversely affect the delivery outcomes [20-22]. However, this unlikely to be true in our study. In South-East Asia, early marriage is a social norm. Smoking, though common in older women, is not socially acceptable among younger women. Not including smoking habit of mothers is another limitation of this study.

This study identified that the odds of having low APGAR score, neonatal death in teenage age group is not statistically significant compared to the non-teenage women. This is in agreement with recent studies [23-24]. However, this is a hospital based study where most of the complications that would otherwise have adverse outcomes in a community setting, are well-managed. This could also be the reason for non-significant differences in post-partum haemorrhage between the two groups.

Some studies have shown that the risk of Caesarean section is increased in teenage pregnancy [25] while some have shown the opposite [20, 23]. This study shows that this risk is decreased significantly, which could be due to a higher incidence of low birth weight in teenage pregnancies as this would be associated with

	Women aged 15-19 (%) (n=790)	Women aged 20-29 (%) (n=3,311)	Odds ratio (95% CI)	P-Value
Type of Delivery <sup>#</sup>				
Episiotomy	112 (14.17)	404 (12.20)	0.76 (0.60-0.96)	<0.05
Instrumental	37 (04.68)	178 (5.37)	0.67 (0.46-0.97)	<0.05
Caesarean	72 (09.11)	391 (11.80)	0.69 (0.51-0.91)	<0.05
PPH <sup>\$</sup>	13 (01.64)	50 (01.51)	1.15 (0.59-2.21)	NS, 0.67

**Table 3:** Maternal Outcomes

CI = Confidence Interval, NS = Not Significant

All logistic regression analyses included ethnic group and parity. Additional confounding factors in the logistic regression are indicated by superscript symbols. # Presentation \$ Type of delivery

a higher chance of successful vaginal delivery<sup>20</sup>. In addition, local gynecologists are reluctant to perform surgical procedures on teenagers (personal communication). The decreased risk of episiotomy and instrumental delivery among teenage groups in this study adds on to suggest gynecologists' reluctance to perform surgical procedures in teenagers. Another possibility is that teenage women understand that teenage pregnancy is a risk and may present to the hospital early compared to non-teenage women. This is supported by the fact that this was a hospital-based study that included women from a good socioeconomic status relative to the majority of the population, suggesting an increased awareness of pregnancy related complications.

Further information on socioeconomic and behavioral variables is needed to confidently conclude on adverse effects of teenage pregnancy. We suggest a community based prospective collection of data for this.

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