

ORIGINAL RESEARCH ARTICLE

PERINATAL OUTCOME IN ADOLESCENT PREGNANCY: A RETROSPECTIVE STUDY AT KARNALI ACADEMY OF HEALTH SCIENCES

Nirajana Kayastha^{1*}, Sandeep Shrestha¹, Namrata Sindan¹

¹Department of Obstetrics and Gynecology and Department of Neonatology, Karnali Academy of Health Sciences, Jumla, Nepal

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*Correspondence to: Nirajana Kayastha, Department of Pediatrics, Karnali Academy of Health Sciences, Jumla, Nepal.

Email: nirajanakayastha@gmail.com

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ABSTRACT

Background: Adolescent pregnancy is a multifactorial social and global health problem, especially in remote, rural setting in low-middle-income countries. This study was conducted to determine the perinatal outcome of adolescent pregnancy of this region.

Methods: A retrospective study was conducted in Karnali Academy of Health Sciences (KAHS), Jumla among nulliparous pregnant adolescent women aged 15 to 19 years (n=363) and those aged 20 to 24 years (n=445) who delivered in this hospital from April 2017 to April 2020 AD. Maternal and perinatal characteristics were compared between these groups. The categorical data between adolescent and adult women were compared. Chi-square test, Odds ratio and 95% confidence interval were examined using SPSS version 16.

Results: During the study period, the incidence of adolescent pregnancy was 22%. The adolescent mothers had significantly higher incidence of anemia (p=0.005, OR:2.7; 95% CI:1.34-5.78), abnormal fetal presentation (p=0.006, OR:3.1; 95% CI:1.38-7.31) and preterm deliveries (p value<0.0001, OR:3.47; 95% CI:1.94-6.19). Regarding perinatal outcome, low birth weight (LBW) babies (p=0.02, OR:1.56; 95% CI:1.07-2.29), lower mean birth weight (2715+/-586 grams) and early neonatal deaths (NNDs) (p=0.02, OR:2.52; 95% CI:1.12-5.69) were significantly associated with adolescent mothers. There was a higher proportion of neonatal admission in adolescent group compared to adult group (p=0.0006, OR:2.18; 95% CI:1.39-3.40).

Conclusions: Adolescent pregnancy is associated with increased risk of anemia, preterm delivery, low birth weight, early neonatal deaths and neonatal admissions. Targeted interventions from the community to health care level are important to decrease the adverse perinatal outcome of adolescent pregnancy.

INTRODUCTION

Adolescent pregnancy is a major public health problem prevalent globally. Approximately 12 million girls aged 15 to 19 years give birth in developing countries yearly.¹ More than 11 percent births globally were because of adolescent mothers with 95% occurring in developing countries.² Nepal is 3rd highest country in child marriage.³ According to National Demographic Health Survey (NDHS) 2016, about 17% of women aged 15 to 19 years have begun childbearing with this trend remaining constant over past five years in Nepal.⁴

Apart from facing obstetrics complications as higher risk of eclampsia, postpartum hemorrhage, and puerperal endometritis, babies born to adolescent mothers have risks as LBW, preterm deliveries and newborn health problems along with higher rates of still births, NNDs and infant deaths.¹

Perinatal outcome of adolescent pregnancies differ among studies. A study conducted in Dhulikhel Hospital, Nepal showed no significant association of maternal age with either gestational age or birthweight of neonates.⁵ Studies done in India and Indonesia showed these pregnancy outcome to be significantly associated with adolescent mothers.^{6,7} Other

studies showed non significant association between younger maternal age and adverse perinatal outcome as still birth and NNDs, whereas studies conducted in Zambia and Nepal showed increased risk of still birth and NNDs among adolescents as compared to adult women.⁸⁻¹¹

There are limited studies conducted to evaluate the perinatal outcome of adolescent pregnancy in our country especially in remote, rural setting as ours hence this study was conducted to identify the perinatal outcome of adolescent pregnancy of this region.

METHODS

This was a retrospective study conducted in KAHS, Jumla. Hospital based services are provided from this institution to patients from Jumla and neighbouring districts as well as it serves as a tertiary referral point among Mugu, Dolpa and Kalilot districts. All singleton nulliparous females aged 15 to 19 years who delivered in this hospital between April 2017 and April 2020 were included as study group whereas, singleton nulliparous females aged 20 to 24 years who delivered in this hospital over the same period were included as comparative

group. The age group 20 to 24 years was taken as comparative group since this age group is considered safer for child birth. The study was commenced after taking ethical approval from Institutional Review Committee (IRC) of KAHS. Inclusion criteria were females aged 15 to 24 years, primigravida and gestation age more than 22 weeks. Those with second or more pregnancy, multiple pregnancy, chronic diseases and gestation age less than 22 weeks were excluded from the study. Data was collected from maternal and neonatal records from Department of Obstetrics and Gynecology and Department of Neonatology between April 2017 and April 2020. The data was entered and analysed using SPSS 16. Categorical data between adolescent and adult women were compared using the chi-square test. Odds ratio (OR) and 95% confidence interval (CI) were used to identify the strength of association. The statistical association was considered significant at p-value <0.05.

RESULTS

During the study period, there was a total of 2037 deliveries conducted in KAHS. The mean maternal age of adolescent group was 18.27+/-0.71 years while that of adult group was 21.5 +/-1.85 years. As shown in table 1, majority of the adolescent (81%) and adult (88%) women were from Jumla followed by Kalikot, Mugu and Dolpa. Most of the babies delivered to both these groups were of term gestation. Only about one fourth (25.8%) of adolescent group and one third (33.6%) of adult group had completed ANC visits as per national protocol. Most of the adolescent and adult women had no ANC visit during their pregnancy accounting for 44.2% and 40.4% of the total cases respectively (Table 1).

Table 2 presents obstetrics characteristics of adolescent and adult women aged 20 to 24 years. The adolescent group had

a significant higher incidence of anemia when compared to women aged 20 to 24 years (p=0.005, OR:2.7; 95% CI:1.34-5.78). Adolescent group was thrice more likely to be have abnormal fetal presentation (breech, shoulder and face) as compared to adult group (p=0.006, OR:3.1; 95% CI: 1.38-7.31). Regarding mode of delivery, adolescent group was more likely to undergo vaginal delivery than adult group (p value= 0.029, OR, 1.43;95% CI: 1.03-1.99) however, though the proportion of caesarean section and instrumental delivery was higher among adult women (14.8% and 2.3% respectively), it was not statistically significant.

Table 1: Characteristics of adolescent group (n=363) and adult group (n=445)

Characteristics	Maternal age	
	<20 years (n,%)	20-25 years (n,%)
Maternal age(years)	18.27+/-0.71 SD	21.5+/-1.85 SD
Address		
Jumla	294(81)	392(88)
Kalikot	36(10)	33(7.6)
Mugu	17(4.6)	8(1.7)
Humla	4(1)	3(0.7)
Dolpa	12(3.4)	9(2)
Gestational age (in weeks)		
< 37	44(12.1)	17(3.8)
37 – 41	297(81.8)	408(91.7)
≥42	22(6.1)	20(4.5)
ANC visits		
>=4	94(25.8)	150(33.6)
<4	109(30)	115(26)
Not done	160(44.2)	180(40.4)

Table 2: Obstetrics characteristics of adolescent group (n=363) and adult group (n=445)

Characteristics	Maternal age		p value	OR(95% CI)
	<20 years (n,%)	20-25 years (n,%)		
Abnormal presentation	20(5.5)	8(1.8)	0.006	3.18(1.38-7.31)
Anemia	24(6.7)	11(2.5)	0.005	2.79(1.34-5.78)
Vaginal delivery	265(73)	354(79.5)	0.029	1.43(1.03-1.99)
Caesarean section	44(12.2)	66(14.8)	0.2	0.79(0.52-1.19)
Instrumental delivery	6(1.8)	10(2.3)	0.5	0.73(0.26-2.03)

Table 3: Perinatal characteristics of adolescent group (n=363) and adult group (n=445)

Characteristics	Maternal age		p- value	OR (95% CI)
	<20 years (n,%)	20-25 years (n,%)		
Prematurity	44(12.1)	17(1.4)	<0.0001	3.47(1.94-6.19)
Birth weight (mean+/-SD) (grams)	2715+/-586	2871+/-496		
Low Birth Weight	69(19)	58(4.7)	0.02	1.56(1.07-2.29)
Very Low Birth Weight	14(3.8)	8(1.8)	0.08	2.19(0.90-5.28)
Extremely Low Birth Weight	8(2.2)	3(0.2)	1.76	3.32(0.87-12.6)
Birth asphyxia	24(6.6)	18(4.04)	1.61	1.67(0.89-3.14)
Neonatal Death	18(5)	9(2)	0.02	2.52(1.12-5.69)
Still birth	9(2.5)	9(2)	0.4	1.23(0.48-3.13)
Congenital malformation	7(2)	3(0.7)	0.12	2.89(0.74-11.2)
Admission to special baby care unit	57(15.7)	35(8)	0.0006	2.18(1.39-3.40)
Post term	22(6.1)	20(4.5)	0.3	1.37(0.73-2.55)

Table 3 shows perinatal characteristics of adolescent and those of women between 20 and 24 years of age. Compared to the adult group, the incidence of preterm delivery was significantly higher among adolescent mothers (p value<0.0001, OR:3.47; 95% CI:1.94-6.19). The mean birth weight was lower among adolescent group than control group (2715+/-586 grams versus 2871+/-496 grams) and they had a higher proportion (19%) of LBW babies delivered as compared to adult group (4.7%) which was statistically significant (p value=0.02, OR:1.56; 95% CI:1.07-2.29). There was no significant difference in the proportion of very low birth weight (VLBW) and extremely low birth weight (ELBW) babies between the two groups. Early NND were twice more likely among adolescent than those of adult group (p-value=0.02, OR:2.52; 95% CI:1.12-5.69). Statistical association was found between maternal age and neonatal admission to SBCU (p value= 0.0006); babies born to adolescent mothers had higher incidence of admission (OR:2.18; 95% CI: 1.39-3.40). There was no statistical difference found in both the groups regarding occurrence of birth asphyxia, congenital malformation, still birth and postmaturity among their babies.

DISCUSSION

Of the total number of 2037 births, adolescent pregnancies accounted for 440(22%) births. Similar high incidence of adolescent pregnancy was detected in a study done by Shruthi et al in India in which the incidence of adolescent pregnancy was 18.3%.¹² But it is much higher compared to study done by Haddabi et al at in Sultan Qaboos University Hospital, Oman in which the incidence of adolescent pregnancy was 1.8%.¹³ Similar low incidence of adolescent pregnancy was observed by Rexhepi et al (2.27%) in Macedonia and Kemfang et al (2.84%) in Cameroon.^{15,16} The incidence of adolescent pregnancy was comparatively higher in our study than others.

Regarding maternal characteristics, only about one fourth (25.8%) of adolescent mothers had completed ANC visits as per national protocol while only about one third (33.6%) of adult mothers had complete regular ANC visits which is in contrast to the national protocol according to which pregnant females are to receive at least four ANC visits. Annual report 2074/2075 of Nepal showed the overall national level coverage of at least four ANC visits was 50%.³ ANC visits are recommended to prevent, identify and reduce adverse maternal and neonatal outcome. Studies done in India and Ethiopia show lower ANC among adolescent compared to adult women similar to our study.^{12,17}

Regarding obstetrics characteristics, the prevalence of anemia in the present study was found to be significantly higher in adolescent mothers compared to adult mothers (6.7% versus 2.5%, p=0.005). Studies from Indonesia, Oman and Macedonia reported the same among pregnant adolescent women (p value <0.001, 0.005 and 0.004 respectively).^{7,13,15} The prevalence of anemia among this group could be attributed to the inadequate ANC visits during which counselling on the intake of iron rich foods are stressed upon and iron supplementation given. Abnormal fetal presentation is found to be significantly

associated with adolescent pregnancy which is inconsistent with the study done by Kassa et al in which no statistically significant difference in the rate of abnormal fetal presentation was observed among adolescent and adult women.¹⁷ The present study found increase in the rate of vaginal delivery among adolescent women. This might be attributed to higher incidence of LBW babies in adolescent pregnancies. This finding corroborates with study done by Paladugu et al in India which is comparable to other studies too.²⁰⁻²² The rate of caesarean section was not significantly different between the two groups which is consistent with other studies.¹⁵⁻²⁰

Regarding perinatal characteristics, the present study found significantly higher odds (3.4 times) of preterm birth among adolescent compared to adult women. The finding of this study is consistent with previous studies.^{6,7,12,13,15} Adolescent mothers were at a higher risk of delivering LBW infants (p=0.02). Similar finding was observed in studies conducted in India, Oman, Cameroon and Ethiopia.^{6,13,16,21} The higher rate of LBW babies born to adolescent mothers could be due to higher incidence of preterm births among adolescent mothers in this study. Early NNDs among adolescent group was almost double that found among mothers aged 20-24 years. According to WHO, the main strategy to reduce neonatal mortality is to prevent adolescent pregnancy especially in developing countries as ours.²⁴ Some studies have found an increased risk of neonatal mortality among adolescent mothers, in contrast to other studies which found no such association.^{9,13,16} These conflicting results might reflect the disparities in the availability of neonatal health facilities in the study areas. This study also found a significant difference in the neonatal admission of babies of adolescent and adult women which is similar to the previous study conducted in tertiary care center of rural India that showed a higher risk of neonatal admission among adolescent women.¹² In addition, a study conducted by Medhi et al also showed a higher risk of neonatal admission rate among babies of adolescent compared to adult women.⁶ The higher rate of preterm deliveries and LBW babies among adolescent group might reflect the higher occurrences of neonatal admissions which is supported by other studies.^{6,25}

Regarding limitation of the study, this is a single tertiary care hospital based study thus might not reflect the scenario of the general population as a whole. Hence, further larger, multi institutional studies are required to address the limitation. Since adolescent pregnancy is associated with adverse perinatal outcome, preventive strategies for adolescent pregnancy and its adverse outcome should be strengthened by policy makers. Interventions as raising the community awareness regarding female literacy which is pivotal to defer early marriage and early pregnancy should be stressed upon. Since adequate ANC visit is crucial to improve the outcome of pregnancy, education and access to ANC should be ensured. Efforts to address social factors as prevention of child marriage and prevention of adolescent pregnancy through school and community health programs should be focused and adolescents should be made aware of services offered by Government led Adolescent Reproductive and Sexual Health (ARSH) program.

CONCLUSION

The incidence of adolescent pregnancy in our study is high. Adolescent women had lesser ANC visits. The present study found a higher risk of adverse perinatal outcome among adolescents compared to adult women. Adolescent pregnancy was associated with anemia, abnormal fetal presentation, preterm deliveries, low birth weight babies, early neonatal deaths and increased neonatal admissions. However, caesarean section, instrumental delivery, very and extremely low birth weight babies, birth asphyxia and congenital anomalies

were not significantly different among the adolescent group compared to the adult group.

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