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Teenage Pregnancy and Fetomaternal Outcomes in Tertiary Maternity Hospital of Nepal

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ABSTRACT

Introduction: Teenage pregnancy is a global public health concern that causes adverse effects on the mother and fetus. In Nepal, the teenage pregnancy burden is high. Several studies have reported that teenage pregnancy and delivery are associated with adverse neonatal outcomes whereas some studies have reported contradictory findings. Thus this study aimed to assess maternal and fetal outcomes of teenage pregnancy in Nepal.

Methods: In a comparative cross-sectional study, we assessed 577 pregnant women aged 13-19 years and 577 adult pregnant women at Paropakar Maternity and Women's Hospital in Kathmandu, Nepal. Singleton pregnant women between the ages of 14 and 19 were assigned to Group A and Singleton pregnant women over the age of 19 were assigned to Group B. Maternal outcomes examined hypertensive disorders, gestational diabetes, anemia, genital tract injuries during vaginal delivery, and postpartum hemorrhage (excessive bleeding after childbirth). Fetal outcomes included low birth weight (LBW), preterm birth, low Apgar score at 5 minutes, neonatal death, and stillbirth. The chi-square test was employed to ascertain the association between teenage pregnancy and maternal and fetal complications.

Results: A total of 9360 deliveries were performed during the study period out of this 577(6.2%) were teenage pregnancies. For the study group, the mean age was 18.3 ± 0.9 years compared with 20.1 ± 2.3 years for the older group. Thirteen percent of participants from Group A and 1% from Group B had maternal complications. Around 16% of women have fetal complications, and 20% of these complications were among Group A.

Conclusions: Teenage pregnancies showed higher rates of maternal and fetal complications compared to adult pregnancies. These complications include genital tract injuries, postpartum hemorrhage, and giving birth to low birth weight babies.

Keywords: *teenage, adult, pregnancy, maternal complications, fetal complications, Nepal*

INTRODUCTION

Teenage pregnancy is a pressing global public health issue, with around 14 percent of adolescent girls giving birth before age 18 in 2021, primarily in low- and middle-income countries (LMICs).[1–4] Maternal conditions are a leading cause of disability-adjusted life years and mortality in girls aged 15-19 worldwide.[5] Young adolescent mothers face increased risks of poor birth outcomes, including low birth weights and preterm births. Teenage pregnancy perpetuates cycles of ill health and poverty.[6-10]

Nepal has a high rate of teenage pregnancy, affecting a significant portion of its adolescent population.[11,12] Factors contributing to teenage pregnancy include early marriage, limited education and unemployment,

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unprotected sex, low socioeconomic status, and lack of awareness about contraception. Unintended teenage pregnancies lead to adverse maternal and neonatal outcomes, such as anemia, hypertensive issues, infections, mental illness, and various birth complications.[13] Our study aimed to address these knowledge gaps and evaluate maternal and fetal outcomes in teenage pregnancy at a tertiary hospital in Nepal.

METHODS

An institutional-based comparative cross-sectional study was conducted among teen (13-19 years old) and adult pregnant women with singleton pregnancies seeking maternity care in Paropakar Maternity and Women's Hospital, Nepal. The ethical approval letter was obtained from Institutional Review Board (IRC Ref No: 6//1580)

Study Setting: The study was conducted at Paropakar Maternity and Women's Hospital, Thapathali, Kathmandu from April 2020 to September 2020. It is a tertiary central hospital with 415 beds, 336 of which are for indoor admission, 241 of which are for obstetrics, 61 of which are for gynecology, and 34 of which are for infants.[14]

Study Population: All singleton teenage pregnant women who gave birth at the hospital (PMWH) were included as study participants. Inclusion criteria were i) singleton pregnant women ii) delivered in PMWH, and iii) willing to take part in the study. Exclusion criteria were i) critically ill women, ii) mentally unstable women, and iii) women having communication difficulties. Two groups were compared in the study: Singleton pregnant women between the ages of 14 and 19 were assigned to Group A and Singleton pregnant women over the age of 19 were assigned to Group B

Sample Size: All deliveries by singleton pregnant women at the PMWH hospital between April 2020 and September 2020 were included in the study. Both groups made up the same amount(577) of study participants. Taking reference to the Nepal Demographic Health Survey 2016 where the prevalence of adolescent pregnancy was 17, our sample size had more than 90% power to compare maternal and fetal outcomes between teenage pregnant women and adult women

Data collection: Medical records were used to collect study data, which included information on maternal characteristics, medical and obstetric histories, the progression of the current pregnancy, and perinatal outcomes. The maternal outcomes were preeclampsia, eclampsia, preterm labor, and cesarean section, and instrumental deliveries and fetal outcomes were preterm birth, birth weight, Apgar score, and NICU admission.

The Institutional Review Board at Paropakar Maternity and Women's Hospital approved the study(IRC Ref N0: 6//1580). Informed consent was not required given the retrospective nature of the study and the anonymity of participant information.

Variables and measurement: The primary outcome variables in this study were characterized by maternal and fetal complications. The maternal complication was defined as the occurrence of one or more of the following maternal outcomes: Hypertensive disorders(systolic ≥ 140 or diastolic ≥ 90 mm Hg), Gestational diabetes (during pregnancy, a woman may experience high blood sugar (glucose), which typically goes away after giving delivery.), Anemia, Genital tract injury during vaginal delivery, Postpartum Hemorrhage(heavy bleeding after giving birth). The fetal complication was defined as the occurrence of one or more of the following fetal outcomes: low birth weight (LBW) (delivery of a live infant whose birth weight was less than 2500g), preterm (babies born alive before 37 weeks of pregnancy are completed), low Apgar score at 5 minutes (less than 7), neonatal death (death of a live birth within 28 days), and stillbirth (fetal death at or after 28 weeks gestation).

Data analysis: After being inputted into a master chart, all the data was imported into STATA-10. Data were cleaned to remove outliers. We computed the Chi-square test for categorical variables to evaluate the descriptive traits between Group A and Group B. We utilized the chi-square test to determine the association between teenage pregnancy and maternal and fetal complications. We utilized Fisher's exact test if 2x2 contingency tables with one or more cells have expected frequencies less than 5.

RESULTS

Table 1 represents the characteristics of participants from two groups: Singleton pregnant women between the ages of 14 and 19 and Singleton pregnant women over the age of 19. A total of 9360 deliveries were conducted out of this 577(6.2%) were teenage pregnancies. For Group A, the mean age was 18.3 ± 0.9 years compared with 20.1 ± 2.3 years for the older group. Thirteen percent of Group A had Lower Segment Cesarean Section(LSCS) compared to 8% of Group B had LSCS with a statistically significant difference($p<0.001$). Fourteen percent of women from Group A delivered babies less than 2500 grams (LBW) compared to 10% of women from Group B. Around 7% of neonates born from mothers of Group A were admitted to ICU compared to around 3% of neonates born from Group B. Around 8% of neonates born from Group B had an Apgar score <7/10 compared to 3% of neonates born from Group B.

Table 1. Characteristics of Participants

Characteristics	Total (n=1154) n(%)	Group A# (n=577) n(%)	Group B# (n=577) n (%)	P-value
Mothers age (years) Mean(SD)	20.1(2.3)	18.3 (0.9)	21.8(1.7)	**<0.001***
Period of gestation(week)				
<37 weeks	89(7.7)	47(8.2)	42(7.3)	0.581
37 weeks and more	1065(92.3)	530(91.8)	535(92.7)	
Mode of delivery				
Vaginal delivery	991(85.9)	466(80.8)	525(91.0)	
Cesarean section	150(13.0)	103(13.8)	47(8.1)	**<0.001***
Instrumental delivery	12(1.1)	8(1.4)	5(0.9)	
Parity				
Primi	915(79.3)	502(87.0)	413(71.6)	
Multi	239(20.7)	75(13.0)	164(28.4)	**<0.001***
Birth weight(grams)				
<2500	142(12.3)	82(14.2)	60(10.4)	
2500 and above	1012(87.7)	495(85.8)	517(89.6)	**0.049***
Child gender				
Male	637(55.2)	322(55.8)	315(54.6)	
Female	517(44.8)	255(44.2)	262(45.4)	**0.679**
Neonates admission at ICU				
Yes	56(4.8)	40(6.9)	16(2.8)	
No	1098(95.2)	537(93.1)	561(97.2)	**<0.001***
Apgar score (1 min)				
<7/10	901(78.1)	327(56.7)	574(99.5)	
7/10 and above	253(21.9)	250(43.3)	3(0.5)	**<0.001***
Apgar score (5 min)				
<7/10	66(5.7)	48(8.3)	18(3.1)	
7/10 and above	1088(94.3)	529(91.7)	559(96.9)	**<0.001***

**statistically significance (p-value-<0.05)*
#Group A: Singleton pregnant women between the ages of 14 to 19
#Group B: Singleton pregnant women over the age of 19

Table 2 shows the maternal and fetal complications in Group A and B. Thirteen percent of participants from Group A and 1% from Group B had at least one of maternal complication. Maternal complications such as hypertensive disorders, gestational diabetes, anemia, genital tract injury during vaginal delivery, and postpartum hemorrhage are higher among Group A compared to Group B. Around 16% of women have at least one of any fetal complications; higher among teenage mothers (20.4% Vs 12.5%; p<0.001). Fetal complications such as birth asphyxia, congenital anomaly, intrauterine fetal death, preterm birth, and low birth weight were higher among Group A compared to Group B.

Table 2. Maternal and Fetal complications

Characteristics	Total (n=1154)	Group A (n=577)	Group B (n=577)	P-value
	n(%)	n(%)	n (%)	
Maternal complications				
Overall	82(7.1)	75(13.0)	7(1.2)	<0.001*
Hypertensive disorders	17(1.5)	17(2.9)	0	-
Gestational diabetes	4(0.3)	4(0.7)	0	-
Anemia	2(0.2)	2(0.3)	0	-
Genital tract injury during vaginal delivery	37(3.2)	36(6.2)	1(0.2)	<0.001*
Postpartum Hemorrhage	22(1.9)	16(2.8)	6(1.0)	0.031*
None	1072(92.9)	502(87.0)	570(98.8)	-
Fetal complication				
Overall	190(16.5)	118(20.4)	72(12.5)	<0.001*
Birth Asphyxia	22(1.9)	22(3.8)	0	-
Congenital anomaly	3(0.3)	2(0.3)	1(0.2)	0.563
Intrauterine fetal death	14(1.2)	8(1.4)	6(1.0)	0.591
Preterm birth	89(7.7)	47(8.1)	42(7.3)	0.581
Low birth weight	142(12.3)	82(14.2)	60(10.4)	0.049*
Small for Gestational Age(SGA)	27(2.3)	0	27(4.7)	-
None	971(84.1)	462(80.1)	509(88.2)	-

**statistically significance (p-value-<0.05)*
#Group A: Singleton pregnant women between the ages of 14 and 19
#Group B: Singleton pregnant women over the age of 19 groups

DISCUSSION

The study reported 6.2% of total deliveries had teenage pregnancy. Maternal complications such as genital tract injury (6% Vs 0.2%) and postpartum hemorrhage (2.8% Vs 1%) were higher among teenage pregnant mothers. Similarly, fetal complications such as giving birth to a low birth weight baby (14% Vs 10%) were higher among Group A compared to Group B.

This study shows that 577 (6.2%) of the 9360 deliveries were teenage pregnancies which was comparatively lower compared to the national survey 2016 that shows 17% of adolescent women aged 15-19 are already mothers[12] and the study from a community hospital of rural Nepal that showed 29.06% of participants had teenage pregnancies.[15] This might be due to the reason that Paropakar Hospital is located in urban settings where the age of first marriage and sexual intercourse is higher compared to rural settings which could have led to lower teenage pregnancy compared to National and rural settings.[12]

This study demonstrated that a higher percentage of teenage pregnant women underwent lower segment cesarean sections (LSCS) compared to the other group (13.8% vs 8.2%; p<0.001) similar to findings from Sweden[16] and Saudi Arabia[17] but contract to the findings from India[13] and Nigeria[18]. In our study, high LSCS might be due to maternal complications such as hypertensive disorders and gestational diabetes seen among teenage mothers.[19] Our study showed newborn babies from teenage mothers had low APGAR scores at 5 minutes (8.3 vs 3.1; p<0.001) similar to studies from China[20], Egypt[2] , and Canada[21]. But findings from Thailand[22] and the Republic of Lebanon[23] showed similar APGAR scores in both study and other groups. This could be due to other maternal and fetal complications such as anemia, high cesarean rate, low birth weight,[24] among our teenage mothers.

This study reported a greater percentage of teenage mothers experience at least one maternal complication compared to adult mothers (13% Vs 1%; p<0.001) similar to findings from Iraq[3] but contrast to the findings from Thailand.[25] It might be due to the reasons that teenage mothers had pregnancy complications like hypertensive disorder, anemia, gestational diabetes[26] and more cesarean sections[27] in our study group (Group A). Genital tract injury during vaginal delivery is higher among teenage mothers (6.2% Vs 0.2%;p <0.001**)** corroborate by findings from Bangladesh that show genital tract injury occurred only in teenage mother (6.5%).[28] The incomplete development of the genital tract and the musculoskeletal system of pregnant

adolescents might have predisposed them to worse genital injury during delivery.

This study reported teenage mothers to experience a greater risk of having at least any of the one fetal complications compared to adult mothers (20.4% Vs 12.5%;p<0.001). The study shows that a higher percentage of teenage mothers delivered babies weighing less than 2500 grams (LBW) compared to adult mothers (14% vs 10%; p=0.048). The results are comparable to research in Ethiopia, where the percentage of low birth weight babies was 21.1% in teen pregnancies and 9.3% in adult pregnancies[14] and study from Egypt[2] and India.[29,30] It can be explained due to the presence of an immature female reproductive system during teenage pregnancy.[31] There is no association between teenage pregnancies and preterm birth (p=0.5812) in contrast to findings from India[13,30], Ethiopia[14,] and Egypt[2]. or other issues such as congenital anomalies and intrauterine fetal mortality (p=0.4635)

The key advantage of this study is its large sample size and therefore the associated statistical reliability of its results. But, we acknowledge some limitations in this study. First, the study was retrospective by design and therefore there is no control over the collection of the data for the purposes of the study. Second, maternal and fetal outcomes of teenage pregnancy could have been confounded by the different sociodemographic characteristics in the two groups, which could not be assessed in this study using multivariable models. Third, the study participants were women who visited health facilities for maternity care; it might suffer from selection bias and limits generalizability. Fourth, we could not establish the temporality of the relationship between teenage pregnancy and fetomaternal outcome due to the cross-sectional nature of the study.

CONCLUSIONS

Our study concluded that teenage mothers have adverse maternal and fetal complications as compared to adult mothers. We recommend colossal awareness programs to adolescents, their parents, and the community regarding the negative health consequences of teenage pregnancy to prevent maternal and perinatal morbidity and mortality in the developing world.

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CONFLICT OF INTEREST

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REFERENCES

1. Dutta I, Joshi P. Maternal and perinatal outcome in teenage vs. Vicenarian primigravidae - a clinical study. J Clin Diagn Res. 2013;7: 2881–2884.
2. Edessy M, Gaber M, Maher A-R. Teenage pregnancy and fetal outcome. Available: http://www.usa-journals.com/wp-content/uploads/2014/09/Edessy2_Vol210.pdf
3. Najim T, Ghathwan KI, Alnakkash UM, Abdelraheem Y. The Impact of Teenage Pregnancy on Maternal, Fetal and Neonatal Outcomes. International Journal of Scientific Research in Knowledge. 2015;3: 106–113.
4. Adolescent health. [cited 22 Feb 2023]. Available: https://www.who.int/health-topics/adolescent-health
5. Early childbearing. In: UNICEF DATA [Internet]. 19 Dec 2017 [cited 22 Feb 2023]. Available: https://data.unicef.org/topic/child-health/adolescent-health/
6. Adolescent pregnancy. [cited 5 Mar 2023]. Available: https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy
7. Neal SE, Chandra-Mouli V, Chou D. Adolescent first births in East Africa: disaggregating characteristics, trends and determinants. Reprod Health. 2015;12: 13.
8. Jewkes R, Morrell R, Christofides N. Empowering teenagers to prevent pregnancy: lessons from South Africa. Cult Health Sex. 2009;11: 675–688.
9. Jonas K, Crutzen R, van den Borne B, Sewpaul R, Reddy P. Teenage pregnancy rates and associations with other health risk behaviours: a three-wave cross-sectional study among South African school-going adolescents. Reprod Health. 2016;13: 1–14.
10. O'loughlin J. Preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries: what the evidence says. apps.who.int; 2012 [cited 14 Mar 2023]. Available: https://apps.who.int/iris/bitstream/handle/10665/70813/WHO_FWC_MCA_12_02_eng.pdf
11. Population Monograph of Nepal: Population dynamics. Government of Nepal, National Planning Commission Secretariat, Central Bureau of Statistics; 2014.
12. Ministry of Health (MOH). Demographic and Health Survey 2016 - Nepal. 2017. Available: https://microdata.worldbank.org/index.php/catalog/2929/study-description
13. Mahavarkar SH, Madhu CK, Mule VD. A comparative study of teenage pregnancy. J Obstet Gynaecol. 2008;28: 604–607.
14. Paropakar Maternity & Women's Hospital. [cited 19 Feb 2023]. Available: https://www.hamrodoctor.com/hospital/paropakar-maternity-and-women-s-hospital
15. Maharjan M, Thapa N, Maharjan N, Rai P, Pun P, Petrini MA, et al. (PDF) Prevalence of Teenage Pregnancy in A Community Hospital of Rural Nepal: A Cross-Sectional Study. JNMA J Nepal Med Assoc. 2019;57: 176–180.
16. Tyrberg RB, Blomberg M, Kjølhede P. Deliveries among teenage women - with emphasis on incidence and mode of delivery: a Swedish national survey from 1973 to 2010. BMC Pregnancy Childbirth. 2013;13: 204.
17. Mohamed AAA, Almalaq AAA, Almansour RDM, Alanazi HSA, Al-Khamali MM, Shommo SAM. Mode of delivery and birthweight among teenage and adult primigravida Saudi women: A retrospective comparative study. J Obstet Gynaecol Res. 2015;41: 1721–1725.
18. Omole-Ohonsi A, Attah RA. Obstetric outcome of teenage pregnancy in Kano, North-Western Nigeria. West Afr J Med.

2010;29: 318–322.

19. Wu Y, Kataria Y, Wang Z, Ming W-K, Ellervik C. Factors associated with successful vaginal birth after a cesarean section: a systematic review and meta-analysis. BMC Pregnancy Childbirth. 2019;19: 360.
20. Chen X-K, Wen SW, Fleming N, Demissie K, Rhoads GG, Walker M. Teenage pregnancy and adverse birth outcomes: a large population based retrospective cohort study. Int J Epidemiol. 2007;36: 368–373.
21. Wong SPW, Twynstra J, Gilliland JA, Cook JL, Seabrook JA. Risk Factors and Birth Outcomes Associated with Teenage Pregnancy: A Canadian Sample. J Pediatr Adolesc Gynecol. 2020;33: 153–159.
22. Kovavisarach E, Chairaj S, Tosang K, Asavapiriyanont S, Chotigeat U. Outcome of teenage pregnancy in Rajavithi Hospital. J Med Assoc Thai. 2010;93: 1–8.
23. Usta IM, Zoorob D, Abu-Musa A, Naassan G, Nassar AH. Obstetric outcome of teenage pregnancies compared with adult pregnancies. Acta Obstet Gynecol Scand. 2008;87: 178–183.
24. Yeshaneh A, Kassa A, Kassa ZY, Adane D, Fikadu Y, Wassie ST, et al. The determinants of 5th minute low Apgar score among newborns who delivered at public hospitals in Hawassa City, South Ethiopia. BMC Pediatr. 2021;21: 266.
25. Narukhutrpichai P, Khrutmuang D, Chattrapiban T. The obstetrics and neonatal outcomes of teenage pregnancy in Naresuan University Hospital. J Med Assoc Thai. 2016;99: 361–367.
26. Evensen A, Anderson JM, Fontaine P. Postpartum Hemorrhage: Prevention and Treatment. Am Fam Physician. 2017;95: 442–449.
27. Fawcus S, Moodley J. Postpartum haemorrhage associated with caesarean section and caesarean hysterectomy. Best Pract Res Clin Obstet Gynaecol. 2013;27: 233–249.
28. Nessa K, Zebunnesa M, Bari N, Saleh AB. Study of Some Sociodemographic Factors in Teenage Pregnancy. Chatt Maa Shi Hosp Med Coll J. 2014;13: 21–25.
29. Rita D, Naik K, Desai RM, Tungal S. Study of feto maternal outcome of teenage pregnancy at tertiary care hospital. 2017 [cited 17 Mar 2023]. doi:10.18203/2320-1770.ijrcog20172610
30. Seneesh KV, Shah M. Feto - Maternal Outcome in Teenage Pregnancy - A Comparative Case Control Study. Journal of Pregnancy and Child Health. 2015;02. doi:10.4172/2376-127X.1000136
31. Roth J, Hendrickson J, Schilling M, Stowell DW. The risk of teen mothers having low birth weight babies: implications of recent medical research for school health personnel. J Sch Health. 1998;68: 271–275.