

The maternal and neonatal outcomes of teenage pregnancy in a tertiary university hospital in Egypt

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Keywords: Teenage pregnancy, obstetric outcome, neonatal outcome

Abstract

Aim: To highlight the grave complications among teenage mothers in Assiut Woman's Health Hospital compared with the adult mothers.

Methods: This study was a prospective case control study, conducted at the Labor Ward of Assiut Woman's Health Hospital from 1st of January 2016 to 30th of June 2016. We included teenage pregnant women (13-19 completed years at delivery) as case and adult mothers (20-29 years) formed the control group. The primary outcome of the study is the rate of pregnancy complications among teenage mothers.

Results: Obstetric complications were higher among the teenage mothers ($p=0.0001$). The teenage mothers had a higher proportion of normal vaginal delivery ($p=0.005$). The adult mothers reported a higher rate of elective cesarean section (CS) and operative vaginal delivery ($p=0.0001$, $p=0.002$; respectively). The infants of teenage mothers tended to have a lower birth weight and Apgar score than the adult ones.

Conclusion: This study clearly states that the teenage mothers and their infants were more liable to complications during pregnancy and

labor compared to adult mothers.

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Introduction

Teenage pregnancy is a serious problem in both developed and developing countries.¹ Teenage or adolescent pregnancy is influenced by various factors. The pregnancy rate among teenagers varies according to their levels of sexual activity, general sex education provided and access to affordable contraceptive options among countries.² Many studies done all over the world have suggested that teenage pregnancies are on the increase.^{3,4}

Teenage pregnancies characterize a high-risk group in reproductive terms because of the double load of

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reproduction and developmental growth.⁵

About 95% of teenage births occur in developing countries.⁶ In Egypt, a developing country, adolescent pregnancy ranges from 4.1% in urban societies to 11.3% in rural areas.⁷

There are many unfavorable maternal outcomes of teenage pregnancy such as preterm delivery, anemia in pregnancy, hypertensive disorders, urinary tract infection, miscarriage, sexually transmitted diseases, traumatic fistulas, postpartum infection, psychological illness, a high rate of cesarean deliveries and fetal distress.⁸ Teenage mothers aged 10-14 years have a maternal mortality rate (MMR) which is about 5 times higher than the MMR for the mothers aged 20-24 years.⁹ Also, there are many adverse fetal outcomes such as preterm births, low birth weight infants, still births, birth asphyxia, respiratory distress syndrome and birth trauma or injury.¹⁰

Reasons for the increased teenage and adolescent pregnancy rate in developing countries are multifactorial including behavioral, traditional, social, educational or religious bases. The most important factors are poverty and low socioeconomic status.¹¹

Studies on complications in teenage pregnancy have yielded contradictory results, and opinions vary among authors in this regard. Some found that age of the mother by itself is not a risk factor, and poor outcomes are linked more with socioeconomic factors rather than with biological factors.¹² Other researchers didn't find any evidence for pregnancy complications among

teenage mothers who received high-quality maternal care with complete coverage.¹³

Based on the above evidence, our study aimed to highlight the grave complications among teenage mothers in Assiut Woman's Health Hospital, which is the largest tertiary center in Upper Egypt and to compare these complications with their adult counterparts.

Material and methods

This study was a prospective case control study, conducted at the Labor Ward of Assiut Woman's Health Hospital from 1st of January 2016 to 30th of June 2016, compassing the complications of pregnancy among teenager's mothers. We included women with teenage pregnancy which is defined as pregnancy occurring during the maternal ages of 13-19 completed years at delivery as case,¹⁴ while adult mothers aged 20-29 years formed the control group. The control group was selected since this age-group is generally regarded as safe for childbirth.¹⁵

Those excluded from the study were women older than 30 years and women with major chronic illnesses such as heart, kidney diseases, bronchial asthma, diabetes mellitus, hypothyroidism and connective tissue disorders. The ethical review board of the Faculty of Medicine of the Assiut University approved the study. Informed consent was obtained for participation after discussing the nature of the study.

The participants were entered into the screening phase of the study. This phase included history taking about age,

parity, residency, level of education, working status, gestational age which was calculated from the first day of the last menstrual period or documented 1st trimester ultrasound and antenatal care. Any medical, surgical and obstetric complications in early or late pregnancy were recorded. All mothers who met the inclusion criteria were included in the study.

The recruited women were examined abdominally to assess the lie, presentation and position of the fetus. Two dimensional trans-abdominal ultrasound was done to evaluate the gestational age and estimated fetal weight, amniotic fluid volume, placental site and to exclude major fetal malformations.

Details of delivery were observed and recorded regarding the mode of delivery and postpartum complications. Details of the postnatal period were recorded including the birth weight, neonatal morbidities (birth asphyxia, neonatal resuscitation, neonatal hyperbilirubinaemia, meconium stained amniotic fluid, meconium aspiration syndrome, sepsis, NICU admission, congenital anomalies and respiratory distress syndrome) and mortalities. Mothers and babies were closely observed for 24 hours till discharge.

The data were collected and entered into a Microsoft Access database and

analyzed using SPSS version 21 (SPSS Inc., Chicago, IL, USA). The demographic and baseline data were compared between the groups. The outcome variables were calculated using an unpaired t test between groups. For dichotomous variables, Chi-square was used to estimate the significance value. For analysis, $p < 0.05$ was considered significant.

Results

Out of 3600 eligible pregnant women who presented to our hospital, 3556 consented to participate. Thirty women didn't meet the inclusion criteria and 14 women were not willing to participate in the study.

The demographic data of the two groups are shown in Table 1. The mean age of teenage mothers was 17.49 ± 0.63 compared to 28.43 ± 5.64 of adults. In regards to parity, the adults mothers were more parous than the teenage mothers ($p=0.0001$). The majority of studied women were from rural areas ($p=0.0001$). More of the adult mothers worked than teenage mothers with a statistically significant difference ($p=0.001$). As regards to a previous history of abortion and previous delivery by CS; adult mothers had higher numbers than teenage mothers with a statistically significant difference ($p=0.0001$).

Table 1: Demographic data of the study participants

Characteristics	Teenage (n=606)	Adult (n=2950)	P-Value
Age	17.49±0.63	28.43±5.64	0.0001*
Parity	0.53 ± 0.79	2.79 ± 2.33	0.0001*
Residence			
Urban	30 (5)	421 (14.3)	
Rural	576 (95)	2529 (85.7)	0.0001*
Education			
Illiterate	597 (98.5)	2835 (96.1)	
Primary	3 (0.5)	25 (0.8)	0.011*
Secondary	6 (1)	90 (3.1)	
Working Status			
Yes	6 (1)	96 (3.3)	0.001*
Previous Abortion	0.19± 0.45	0.54±1.05	0.0001*
Previous CS	0.17±0.46	0.66±1.01	0.0001*

*Statistical significant difference (P < 0.05)

Data are expressed as n (%) or mean ± standard deviation

Table 2 summarizes the obstetric complications in both groups. Although obstetric complications were not statistically significant between the two groups (p=0.062), certain complications were significantly higher in teenage mothers. These include intrauterine growth restriction (IUGR) (p=0.001), oligohydramnios (p=0.032), congenital anomalies (p=0.003), eclampsia (p=0.0001) and accidental hemorrhage (p=0.001). There was no statistically significant difference between both groups as regard to the gestational age at delivery (p=0.144).

The teenage mothers had a higher proportion of normal delivery (p=0.005). The adult mothers reported higher rate of elective CS and operative vaginal delivery with a statistically significant difference (p=0.0001 and 0.002; respectively). However the teenage group reported a higher rate of emergent CS with statistically significant difference (p=0.0001) (Table 3). There was no difference in postpartum morbidities between the two groups in regard to the occurrence of postpartum hemorrhage, need for hysterectomy, blood transfusion and ICU admission.

Table 2: Maternal outcomes during pregnancy of the study participants

Characteristics	Teenage (n=606)		Adult (n=2950)		p-value
Complications in early pregnancy [#]	57	9.4	294	10	0.275
Complications in late pregnancy [#]	285	47	1241	42.1	0.062
Gestational DM	3	0.5	9	0.3	0.071
Breech	27	4.5	120	4.1	0.245
Malpresentation	3	0.5	33	1.1	0.002*
Gestational HTN	24	3.9	117	3.9	0.742
IUGR	9	1.5	21	0.7	0.001*
Postdate	30	4.9	135	4.6	0.156
Oligohydramnios	24	3.9	72	2.4	0.032*
Congenital anomalies	12	2	15	0.5	0.003*
Preeclampsia	42	6.9	224	8.3	0.001*
Cord prolapse	3	0.5	9	0.3	0.521
Eclampsia	15	2.5	18	0.6	0.0001*
PROM	51	8.4	270	9.2	0.081
Preterm labor	30	4.9	132	4.5	0.274
Placenta Previa	3	0.5	48	1.6	0.002*
Accidental hemorrhage	9	1.5	15	0.5	0.001*
Rupture uterus	0	0	3	0.1	0.128
Multiple pregnancy	27	4.5	159	5.4	0.321
Gestational age at delivery (weeks) ⁺	37.18±3.28		37.39±2.99		0.144
Hemoglobin level at delivery (gm/dl) ⁺	11.29±1.50		11.17±1.56		0.379
Duration of hospital stay (days) ⁺	1.34±1.42		1.64±2.62		0.007*

DM; diabetes mellitus, HTN; hypertension, IUGR; intrauterine growth restriction, PROM; premature rupture of membranes

[#] Data expressed as number (%), ⁺ data expressed as mean± SD

* Statistical significant difference (P < 0.05)

Table 3: Mode of delivery and postpartum morbidities in the study participants

Mode of delivery	Teenage (n=549)	Adult (n=2656)	p-value
Elective CS	129 (23.5)	1035 (39)	0.0001*
Emergency CS	195 (35.5)	697 (26.2)	0.0001*
Ventouse	0	15 (0.6)	0.002*
Vaginal delivery	225 (41)	909 (34.2)	0.005*
Postpartum morbidities			
PPH	12 (2)	60 (2)	0.938
Hysterectomy	1 (0.2)	21 (0.7)	0.291
Blood transfusion	48 (7.9)	189 (6.4)	0.217
ICU admission	12 (2)	63 (2.1)	0.130

CS; cesarean section, PPH; postpartum hemorrhage, ICU; intensive care unit.

* Statistical significant difference (P < 0.05) Data expressed as number (%)

As regard the neonatal outcomes in both study groups, teenage mothers had significantly lower birth weight infants ($p=0.019$) with lower Apgar scores

(0.004) than adult mothers. However, stillbirths were more common in adult mothers ($p=0.0001$). (Table 4)

Table 4: The neonatal outcomes of the study participants

Outcomes	Teenage (n=549)	Adult (n=2656)	p-value
Living [#]	537 (97.8)	2557 (96.6)	
Dead	12 (2.2)	99 (3.4)	0.0001*
Male [#]	288 (52.5)	1434 (58.6)	0.703
Female	261 (47.5)	1222 (41.4)	
Admission to NICU [#]	108 (19.7)	441 (14.9)	0.177
Apgar score ⁺	9.21 ± 1.83	9.42 ± 1.48	0.004*
Fetal weight ⁺	2932.4±722.9	3017.8±775.9	0.019*

NICU; neonatal intensive care unit.

* Statistical significant difference ($P < 0.05$)

Data expressed as number (%), ⁺ data expressed as mean± SD

Discussion

Maternal mortality and morbidity among teenagers represent an extensive public health problem at the universal level.¹⁶ The present work demonstrated that the incidence of teenage pregnancy is high in Upper Egypt accounting for about 17% of all pregnancies. Complications in late pregnancy such as IUGR and oligohydramnios were higher among the teenage mothers; however, postpartum complications were higher among the adult mothers. Normal vaginal delivery was higher among the teenage mothers while instrumental vaginal delivery and elective CS were higher among the adult mothers.

The incidence of teenage pregnancy in our study is 17 % and the majority of cases are from the rural area. Al-Haddabi reported teenage mothers that were in the same range as our study (16–18%).¹⁷ However, Kumar et al., in 2007,¹⁸ showed that the incidence of teenage pregnancy is 4% this difference may be attributed to small sample size (1476 women) used by Kumar et al. compared to our study (3556 women). Moreover, Sweden reported less incidence teenage mothers, less than 3% of all infants are delivered by teenage mothers. Sweden's high level of socioeconomic circumstances informs this difference.

The unemployment rate of teenage mothers (99%) was much higher than the unemployment rate of adult women in the present study (96.7%). Kaisa et al. also reported that the more adult mothers work than teen mothers (83.1% versus 62.45% in teenage mothers).¹⁹

Previous studies reported that the hypertensive disorders of pregnancy are higher among the teenage mothers^{20,21}; however in the present study only eclampsia was higher among the teenage mothers. This may be due to the fact that most of the teenage pregnant women are from the rural areas with lack of antenatal visits so most of them presented with late complications of hypertensive disorders of pregnancy like eclampsia. This indicates that the teenage mothers were less careful about their pregnancy probably because of the lack of awareness and maturity.

Ziadeh reported no difference between the groups regarding antepartum hemorrhage as it was not seen to be associated with maternal age,^{20,22} however in our study, the incidence of antepartum hemorrhage due to placenta previa was higher among the adult mothers because the adult mothers were more parous than the teenage counterparts.

Derme and his colleagues reported that premature rupture of membranes (PROM) and oligohydramnios were the most common diseases among teenage pregnant women, while IUGR was the most common fetal diseases. Our results confirm this.²³

Teenagers have also been reported to undergo normal vaginal delivery more

often than adults and to have a lower proportion of cesarean deliveries or instrumental vaginal deliveries. This finding was also consistent with those of Derme et al. and Abdelsattar.^{23,24} The better predisposition of teenage pregnant women to have a spontaneous vaginal delivery is due to better myometrial function, greater connective tissue elasticity and lower cervical compliance.

The mode of delivery in our study reflected a remarkable increase in emergency CS among teenage mothers versus adult mothers. Ezegwui et al. and Nwobodo et al. also confirmed the same findings.^{25,26}

Teenage pregnancy could increase the family size with short inter-pregnancy interval. This could lead to substandard nutrition in young-age mothers adding more risks during subsequent pregnancies especially if there is pregnancy-lactation over lap.²⁷

Our study results found no statistical significant difference between teenage and adult mothers in regard postpartum morbidities. However, postpartum hemorrhage with its consequences of blood transfusion and peripartum hysterectomy occurred in 12 (2%) teenage mothers. A previous study in our hospital reported that nearly 6% of cases of emergency peripartum hysterectomy were performed in teenage mothers.²⁸ Additionally, 5.2% of all cases of maternal mortality were teenage mothers.²⁹ This is considered a catastrophic consequence of pregnancy and delivery complications in those young age women.

A limitation of the study was that, since

it was conducted in a tertiary care hospital set-up, chances of high-risk cases may be more, and it may not truly reflect the prevailing situation in a community setting. It is possible that some of teenage pregnant women did not come to the hospital due to poverty, ignorance and social reasons.

Certain strategies may reduce the incidence of teenage pregnancy such as increasing the age of marriage and subsequent childbearing, providing education and improving the general health and nutrition of the girl child, postnatal contraception should be encouraged to avoid further pregnancies leading to financial and emotional stability. Greater importance should be given to sex education and contraception to avoid unwanted teenage pregnancies.

In conclusion, our study clearly states that the teenage mothers and their infants were more liable to complications during pregnancy and labor compared to adult mothers.

References

1. Egbe TO, Omeichu A, Halle-Ekane GE, Tchente CN, Egbe EN, Oury JF. Prevalence and outcome of teenage hospital births at the Buea Health District, South West Region, Cameroon. *Reprod Health*. 2015 Dec 23;12:118. <https://doi.org/10.1186/s12978-015-0109-5> PubMed PMID: 26700474; PubMed Central PMCID: PMC4690316.
2. Veena SR, Gale CR, Krishnaveni GV, Kehoe SH, Srinivasan K, Fall CH. Association between maternal nutritional status in pregnancy and offspring cognitive function during childhood and adolescence; a systematic review. *BMC Pregnancy Childbirth*. 2016 Aug 12;16:220. <https://doi.org/10.1186/s12884-016-1011-z> PubMed PMID: 27520466; PubMed Central PMCID: PMC4982007.
3. Dutta I, Joshi P. Maternal and perinatal outcome in teenage vs. Vicenarian primigravidae - a clinical study. *J Clin Diagn Res*. 2013 Dec;7(12):2881-4. https://doi.org/10.7860/JCDR/2013/7265_3783 Epub 2013 Dec 15. PubMed PMID: 24551664; PubMed Central PMCID: PMC3919298.
4. Zhou Y, Puradiredja DI, Abel G. Truancy and teenage pregnancy in English adolescent girls: can we identify those at risk? *J Public Health (Oxf)*. 2016 Jun;38(2):323-9. <https://doi.org/10.1093/pubmed/fdv029> Epub 2015 Mar 16. PubMed PMID: 25784667; PubMed Central PMCID: PMC4894480.
5. Yasmin G, Kumar A, Parihar B. Teenage pregnancy - its impact on maternal and fetal outcome. *International Journal of Scientific Study*. 2014;1(6):9-13.
6. Goossens G, Kadji C, Delvenne V. Teenage pregnancy: a psychopathological risk for mothers and babies? *Psychiatr Danub*. 2015 Sep;27 Suppl 1:S499-503. PubMed PMID: 26417827.
7. Mersal FA, Esmat OM, Khalil GM. Effect of prenatal counselling on compliance and outcomes of teenage pregnancy. *East Mediterr Health J*. 2013 Jan;19(1):10-7. PubMed PMID: 23520900.

8. Coyne CA, D'Onofrio BM. Some (but not much) progress toward understanding teenage childbearing: a review of research from the past decade. *Adv Child Dev Behav.* 2012;42:113-52. <https://doi.org/10.1016/B978-0-12-394388-0.00004-6> PubMed PMID: 22675905; PubMed Central PMCID: PMC3654402.
9. Chandra-Mouli V, Camacho AV, Michaud PA. WHO guidelines on preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries. *J Adolesc Health.* 2013 May;52(5):517-22. <https://doi.org/10.1016/j.jadohealth.2013.03.002> PubMed PMID: 23608717.
10. Hadley A, Ingham R, Chandra-Mouli V. Implementing the United Kingdom's ten-year teenage pregnancy strategy for England (1999-2010): How was this done and what did it achieve? *Reprod Health.* 2016 Nov 22;13(1):139. <https://doi.org/10.1186/s12978-016-0255-4> PubMed PMID: 27876052; PubMed Central PMCID: PMC5120422.
11. Moisan C, Baril C, Muckle G, Belanger RE. Teen pregnancy in Inuit communities - gaps still needed to be filled. *Int J Circumpolar Health.* 2016 Dec 9;75:31790. <https://doi.org/10.3402/ijch.v75.31790> PubMed PMID: 27938638; PubMed Central PMCID: PMC5149662.
12. Blackman K. Evidence-Based Policies to Prevent Teen Pregnancy. *NCSL Legisbrief.* 2016 Apr;24(16):1-2. PubMed PMID: 27825191.
13. Marino JL, Lewis LN, Bateson D, Hickey M, Skinner SR. Teenage mothers. *Aust Fam Physician.* 2016 Oct;45(10):712-717. PubMed PMID: 27695719.
14. Leal I, Luttges C, Troncoso P, Leyton C, Molina T, Eguiguren P. [The legal framework to prevent teenage pregnancies]. *Rev Med Chil.* 2016 May;144(5):577-84. <https://doi.org/10.4067/S0034-98872016000500004> Spanish. PubMed PMID: 27552007.
15. Rogue F. [Teenage pregnancies, legal aspects]. *Soins PEDIATR Pueric.* 2016 Jul-Aug;37(291):19-21. <https://doi.org/10.1016/j.spp.2016.05.004> French. PubMed PMID: 27444530.
16. Lara D, Decker MJ, Brindis CD. Exploring how residential mobility and migration influences teenage pregnancy in five rural communities in California: youth and adult perceptions. *Cult Health Sex.* 2016 Sep;18(9):980-95. <https://doi.org/10.1080/13691058.2016.1150514> Epub 2016 Mar 17. PubMed PMID: 27439657.
17. Al-Haddabi R, Al-Bash M, Al-Mabaihsi N, Al-Maqbali N, Al-Dhughaishi T, Abu-Heija A. Obstetric and perinatal outcomes of teenage pregnant women attending a tertiary teaching hospital in Oman. *Oman Med J.* 2014 Nov;29(6):399-403. <https://doi.org/10.5001/omj.2014.108> PubMed PMID: 25584155; PubMed Central PMCID: PMC4289491.
18. Kumar A, Singh T, Basu S, Pandey S, Bhargava V. Outcome of teenage pregnancy. *Indian J Pediatr.* 2007 Oct;74(10):927-31. <https://doi.org/10.1007/s12098-007-0171-2> PubMed PMID: 17978452.
19. Raatikainen K, Heiskanen N, Verkasalo PK, Heinonen S. Good outcome of teenage pregnancies in high-quality maternity care. *Eur J Public Health.* 2006 Apr;16(2):157-61. Epub 2005 Sep 1. <https://doi.org/10.1093/eurpub/cki158> PubMed PMID: 16141302.

20. Saxena P, Salhan S, Chattopadhyay B, Kohli MPS, Nandan D, Adhish SV. Obstetric and perinatal outcome of teenage and older primigravidas - a retrospective analysis. *Health and Population*. 2010;33(1):16-22.
21. Chahande MS, Jadhao AR, Wadhva SK, Ughade S. Study of some epidemiological factors in teenage pregnancy –hospital-based case comparison study. *Indian Journal of Community Medicine*. 2002;27(3):106-109.
22. Ziadeh S. Obstetric outcome of teenage pregnancies in North Jordan. *Arch Gynecol Obstet*. 2001 Mar;265(1):26-9. <https://doi.org/10.1007/s004040000121> PubMed PMID: 11327089.
23. Derme M, Leoncini E, Vetrano G, Carlomagno L, Aleandri V. Obstetric and perinatal outcomes of teenage pregnant women: a retrospective study *Epidemiology Biostatistics and Public Health*. 2013;10:4.
24. Abdelsattar M. Teenage pregnancy in Upper Egypt. *Int J Adv Res Biol Sci*. 2016; 3(4):35-41.
25. Ezegwui HU, Ikeako LC, Ogbuefi F. Obstetric outcome of teenage pregnancies at a tertiary hospital in Enugu, Nigeria. *Niger J Clin Pract*. 2012 Apr-Jun;15(2):147-50. <https://doi.org/10.4103/1119-3077.97289> PubMed PMID: 22718161.
26. Nwobodo EI, Adoke KU. Obstetric outcome of teenage pregnancies at a tertiary care hospital in Sokoto, Nigeria. *Trop J Obstet Gynaecol*. 2005;22(2):168-70. <http://dx.doi.org/10.4314/tjog.v22i2.14520>
27. Shaaban OM, Abbas AM, Abdel Hafiz HA, Abdelrahman AS, Rashwan M, Othman ER. Effect of pregnancy-lactation overlap on the current pregnancy outcome in women with substandard nutrition: a prospective cohort study. *Facts Views Vis Obgyn*. 2015 Dec 28;7(4):213-221. PubMed PMID: 27729966; PubMed Central PMCID: PMC5058410.
28. Abbas AM, Abdelbadee AY, Amin MT, Abdelrahman RM, Tolba SM, Abdelkarim AR, Shahin AY, Salman SA. Emergency peripartum hysterectomy in a tertiary hospital in Upper Egypt: six years analysis. *Int J Reprod Contracept Obstet Gynecol*. 2016 Apr;5(4):953-958. <https://doi.org/10.18203/2320-1770.ijrcog20160848>
29. Abbas AM, Amin MT, Ali SS, Salem NZ. Maternal mortality: a tertiary care hospital experience in Upper Egypt. *Int J Reprod Contracept Obstet Gynecol*. 2016 May; 5(5):1466-1471. <https://doi.org/10.18203/2320-1770.ijrcog20161306>