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Comparison of Maternal and Neonatal Outcomes of Teenage versus Adult Pregnancies at Buddhachinaraj Hospital

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ABSTRACT

Objectives: To compare outcomes of teenage pregnancy (maternal age younger than 20 years) with adult pregnancy (maternal age 20-34 years).

Materials and Methods: A retrospective cohort study compared first birth teenage deliveries to adult deliveries at Buddhachinaraj Hospital from January 2012 to December 2013.

Main Outcome Measurement: Maternal outcomes were anemia, hypertensive disorder, gestational diabetes mellitus, mode of delivery, and postpartum hemorrhage. Neonatal outcomes included preterm delivery, low birth weight, fetal growth restriction and birth asphyxia.

Results: The prevalence of teenage pregnancy in this study was 17%. Teenage mothers had less frequent antenatal care. Rates of anemia, preterm delivery and low birth weight were significantly higher in teenage compared to adult pregnancy, whereas the rates of gestational diabetes mellitus and postpartum hemorrhage were lower. Rate of normal vaginal delivery was significantly higher in the teenage group compared to the adult pregnancies. No difference in outcome between groups was demonstrated for hypertensive disorder, infectious disorder, fetal growth restriction and birth asphyxia.

Conclusion: Teenage pregnancy had preferable obstetric outcomes for the prevalence of vaginal delivery and postpartum hemorrhage, but had increased neonatal adverse events.

Keywords: teenage pregnancy, maternal outcomes, neonatal outcomes, especially preterm delivery and low birth weight

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การเปรียบเทียบผลการตั้งครรภ์วัยรุ่นกับวัยผู้ใหญ่ที่มาคลอดที่โรงพยาบาลพุทธชินราช พิษณุโลก

ลลิตา โฆษิตวรกิจกุล, วิเศรษฐ วัชโรทน, โชคดี จุลภาคี

วัตถุประสงค์: *เพื่อเปรียบเทียบผลการตั้งครรภ์และการคลอดของสตรีตั้งครรภ์วัยรุ่น (อายุน้อยกว่า 20 ปี) กับวัยผู้ใหญ่ (อายุ 20-34 ปี)*
วัสดุและวิธีการ: *งานวิจัยนี้เป็นการศึกษาแบบ retrospective cohort study โดยเก็บข้อมูลย้อนหลังเปรียบเทียบผลการตั้งครรภ์ และผลการคลอด (เฉพาะการคลอดครั้งแรก) ของหญิงตั้งครรภ์วัยรุ่นกับวัยผู้ใหญ่ ที่มาคลอดที่โรงพยาบาลพุทธชินราช พิษณุโลก ระหว่างเดือนมกราคม 2555 ถึงเดือนธันวาคม 2556*
ผลการศึกษา: *ความชุกของการตั้งครรภ์วัยรุ่นที่โรงพยาบาลพุทธชินราช พิษณุโลก คือ ร้อยละ 17 เมื่อเปรียบเทียบผลของการตั้งครรภ์และการคลอดระหว่างวัยรุ่นกับวัยผู้ใหญ่ พบว่ามารดาตั้งครรภ์วัยรุ่นมีการฝากครรภ์น้อยกว่าวัยผู้ใหญ่ การตั้งครรภ์วัยรุ่นมีภาวะโลหิตจางของมารดาระยะก่อนคลอด, น้ำหนักทารกแรกคลอดน้อย และการคลอดก่อนครบกำหนดมากกว่าวัยผู้ใหญ่อย่างมีนัยสำคัญทางสถิติ การตั้งครรภ์วัยรุ่นพบความชุกของการทำสูติศาสตร์หัตถการ โดยเฉพาะอย่างยิ่งการผ่าตัดคลอดทางหน้าท้อง และภาวะตกเลือดหลังคลอดน้อยกว่าการตั้งครรภ์วัยผู้ใหญ่ ส่วนภาวะเบาหวานขณะตั้งครรภ์ และภาวะตกเลือดหลังคลอด ในกลุ่มตั้งครรภ์วัยรุ่นพบน้อยกว่าอย่างมีนัยสำคัญทางสถิติ ภาวะความดันโลหิตสูงขณะตั้งครรภ์ ภาวะโรคติดเชื้อ ภาวะทารกโตช้าในครรภ์ และภาวะขาดออกซิเจนของทารกแรกคลอดไม่มีความแตกต่างอย่างมีนัยสำคัญสถิติ*
สรุป: *การตั้งครรภ์วัยรุ่นมีผลการตั้งครรภ์และการคลอดที่ดีในด้านของช่องทางการคลอด และการตกเลือดหลังคลอด แต่พบภาวะแทรกซ้อนต่อทารกสูงกว่าการตั้งครรภ์ในวัยผู้ใหญ่*

Introduction

The society, culture and environment are changing. Teens are engaging in sexual activity at an earlier age. Age at first sexual intercourse was found to decrease steadily with inadequate contraceptive use. Unintended teenage pregnancy has resulted in education, socioeconomic problems and complications for the mother and the babies. Teenage pregnancy rates were found to be higher in developing countries compared to developed countries. The World Health Organization (WHO) reported that 16 million women ages 15-19 years old give birth each year, accounting for about 11% of births worldwide[1]. Almost all of these births occur in low and middle-income countries. A Swedish national survey conducting during 1973 to 2010 found that annual incidence of adolescent pregnancy decreased significantly from 7.7 to 1.6%[2]. The Centers for Disease Control and Prevention (CDC) reported a decline in teen birth rate for all races from 2012 to 2013. In the year 2015, birth rates decreased by 10% for Asian/ Pacific Islanders ages 15-19 years old[3]. From 2010 to 2013, adolescent birth rate in Singapore was 6 per 1,000 women ages 15-19 years, while the rate in Thailand was 40 (United Nations population division, world population prospects)[4]. Although Asian teen birth rate declined, Thailand has a higher rate. In Thailand, teen birth rate increased from 12.9% in 2003 to 16.6% in 2012. The rate was 53.8 births per 1,000 women age 15-19 years, or 365 births per day, in 2012[5]. In Buddhachinaraj hospital, incidence of teenage delivery was about 16.5-17.5% from 2008 to 2012. Adolescent pregnancy is harmful to the mother and is associated with many problems, such as anemia, sexually transmitted infections and depression. Additional dangers to the baby include preterm delivery, low birth weight, birth asphyxia, and stillbirth. The World Health Organization reported a 50% higher neonatal death rate among babies born to teenage mothers compared to mothers of 20-29 years old[1].

Materials and Methods

This was a retrospective cohort study conducted at the Department of Obstetrics and Gynecology, Buddhachinaraj Phitsanulok Hospital. The study was approved by Buddhachinaraj Hospital Ethic Committee. Sample size was calculated based on a similar study by Kovavisarach E, 2010 studied at Rajavithi Hospital in Bangkok, which showed a significant difference in low birth weight when comparing teenage to adult pregnancy (incidence 0.176, 0.122)[6], from 750 subjects in each study arm with $\alpha = 0.05$ and $\beta = 0.2$.

The present study reviewed all medical records of first birth teenage pregnancies (age younger than 20 years old at delivery) that were delivered at Buddhachinaraj Hospital from January 2012 to December 2013, a total of 735 cases. A total of 735 first birth adult pregnancies (age 20-34 years old at delivery) who delivered after each study case as a ratio of 1:1 were included as the control group. This study excluded pregnancies with death of the fetus in utero, multiple pregnancies, and those with incomplete medical records. First birth pregnancies were selected to eliminate the influence of parity, and mothers with age less than 34 were selected to eliminate the influence of advanced maternal age. Both groups received care from doctors and nurses on duty as routine protocol during admission and delivery. Maternal age was defined as the woman's age at delivery. Anemia was defined as hematocrit of less than 33% at antenatal care or before delivery. Gestational diabetes mellitus diagnosis was based on 100-g OGTT of National Diabetes Data Group criteria. Hypertensive disorder definition followed ACOG Practice Bulletin No.33[7]. Postpartum hemorrhage was defined as the loss of more than 500 ml of blood within the first 24 hours following vaginal delivery or the loss of more than 1,000 ml of blood within the first 24 hours after cesarean section. Fetal growth restriction was defined as estimated fetal weight below 10th percentile or newborn weight below 10th percentile for gestational age. Preterm delivery was defined as delivery at gestational age of less than 37 weeks. Low birth weight was defined as newborn weight at birth less than 2,500 g. Birth asphyxia was defined as Apgar score lower than 7 at 5 minutes.

Data from the patient characteristics, antepartum,

intrapartum, postpartum outcomes and neonatal outcomes were recorded in the designed record forms and were compared and analyzed using Chi-square and Fisher's exact tests. P-values of < 0.05 were considered statistically significant. Relative risk and 95% confidence intervals were calculated where appropriate.

Results

There were a total of 8,659 deliveries at Buddhachinaraj Phitsanulok Hospital during the study period. The prevalence of teenage pregnancy at Buddhachinaraj Hospital was 17%. The youngest teenage mother was 13 years old. Characteristics of the study and control groups are shown in Table 1. Teenage mothers had significantly fewer antenatal care compared with the adult group. Table 1 compares the antepartum outcomes between teenage and adult pregnancy. Teenage women had significantly higher prevalence of anemia complications and lower prevalence of gestational diabetes mellitus incidence compared with the control group. There was no difference in the prevalence of hypertensive and infectious disorders between the two groups. Mode of delivery and postpartum outcomes are compared in Table 2. Operative obstetrics, especially cesarean section, were significantly higher in the adult group. The incidence of postpartum hemorrhage (PPH) was significantly higher in adult pregnancy compared to the study group. Table 3 shows neonatal outcomes. Incidence of preterm delivery and low birth weight were significantly higher in teenage pregnancy compared to adult pregnancy. Fetal growth restriction and birth asphyxia were not significantly different.

Table 1. Characteristic and antepartum outcomes of teenage and adult pregnancies delivered at Buddhachinaraj Phitsanulok Hospital during January 2012 to December 2013.

	Teenage N = 735 (%)	**Adult N = 735 (%)**	**P**
ANC	709 (96.5)	731 (99.5)	< 0.001*
Anemia	241 (33.0)	149 (20.3)	< 0.001*
GDM	1 (0.1)	15 (2.0)	< 0.001†
GDM A1	1 (100.0)	9 (60.0)	0.021†
GDM A2	0 (0.0)	6 (40.0)	0.031†
Hypertensive disorders	25 (3.4)	27 (3.7)	0.778
Severe preeclampsia	17 (68.0)	16 (59.3)	0.860
Gestational Hypertension	4 (16.0)	2 (7.4)	0.687
Chronic Hypertension	0 (0.0)	6 (22.2)	0.031*
Mild preeclampsia	2 (8.0)	1 (3.7)	1.000
Eclampsia	2 (8.0)	1 (3.7)	1.000
Superimpose preeclampsia	0 (0.0)	1 (3.7)	1.000
Infectious disorders			
Condyloma	5 (0.7)	1 (0.1)	0.218
HIV	2 (0.3)	6 (0.8)	0.288
Syphilis	1 (0.1)	0 (0.0)	1.000
UTI	0 (0.0)	3 (0.4)	0.249

* Statistically significant difference by Chi-square test, †statistically significant difference by Fisher's exact test

Table 2. Intrapartum and postpartum outcomes of teenage and adult pregnancies delivered at Buddhachinaraj Phitsanulok Hospital during January 2012 to December 2013.

	Teenage N = 735 (%)	Adult N = 735 (%)	P
Mode of delivery			< 0.001†
Normal vaginal delivery	463 (63.0)	259 (35.2)	
Cesarean section	219 (29.8)	405 (55.1)	
Vacuum extraction	51 (6.9)	66 (9.0)	
Breech assisting	2 (0.3)	5 (0.7)	
Postpartum hemorrhage	24 (3.3)	42 (5.7)	0.023

† Statistical significance difference by Fisher's exact test

Table 3. Neonatal outcomes of teenage and adult pregnancies delivered at Buddhachinaraj Phitsanulok Hospital during January 2012 to December 2013.

	Teenage N=735 (%)	Adult N=735 (%)	OR	95% CI
Intrauterine Growth Restriction	48 (6.5)	41 (5.6)	0.846	0.550 - 1.300
Preterm delivery	124 (16.9)	84 (11.4)	1.58	1.169 - 2.123*
Low Birth Weight	119 (16.2)	76 (10.3)	**1.675	1.231 - 2.279*
Birth asphyxia	7 (1.0)	16 (2.2)	0.433	0.177 - 1.058

* Statistically significant difference by Chi-square test, **the adjusted odds ratio of low birth weight by gestational age from 1.675 to 1.438 (1.007-2.053 95% CI)

Discussion

This study analyzed the outcomes of teenage and adult pregnancy among first births to eliminate the influence of multigravida outcomes. Previous studies examined teenage pregnancy outcomes for both primigravida and multiparous pregnancy[6, 8, 9-11]. It was reported that in teenage pregnancy the outcomes are different between the first and the second births; the second births are associated with preterm labor and stillbirth, but a reduced risk of emergency cesarean section[8]. The rate of antenatal care attention is lower in teenage mothers, and this is also demonstrated in many studies[6,12,13]. The majority of adolescents were at the age of secondary to higher education, which may be the reason for the lack of antenatal care. Incidence of anemia was significantly higher in teenage pregnancies, which was also demonstrated in previous studies[9,11]. However, some studies fail to show the difference in the prevalence of anemia[6,10]. The inadequate antenatal care may explain the insufficient iron supplement and anemia. In such a case, anemia may be solved with good antenatal care and adequate iron supplement. Higher rates of hypertensive disorder were reported in teenage pregnancy[11]. Another study by Jasuvic-Siveska E in Macedonia found that pregnancy induced hypertension most frequently appears in young primiparas and adult multiparus[14]. Similar to previous studies[6,9,10], there was no difference in hypertensive disorder between teenage and adult groups in this study. Hypertensive disorder was associated with parity in addition to maternal age.

The higher rate of normal vaginal delivery and the lower rate of cesarean delivery in teenage pregnancies in this study confirm the results of previous

reports[8,10,11,15]. Postpartum hemorrhage is one of the leading causes of maternal mortality. There was no difference in PPH between teenage and adult pregnancy in previous studies[6,10]. However, this study shows a significant higher prevalence of PPH in the adult group, OR 1.795 (95% CI 1.076 - 2.997). None of these cases were associated with hematologic or coagulopathy disorders.

For neonatal outcomes, this study showed significantly higher incidence of preterm delivery and low birth weight in teenage pregnancy, similar to many previous studies[6,8-13,15]. In addition to teenage pregnancy, low birth weight is also dependent on gestational age. In this study, the adjusted odds ratio of low birth weight by gestational age was 1.675 to 1.438 (1.007-2.053 95% CI).

Conclusion

Incidence of teenage pregnancy is high at Buddhachinaraj Hospital. Positive findings of this study were lower rates of cesarean section and postpartum hemorrhage in the teenage compared to the adult group. Other outcomes and complications of concern in teenage pregnancy include anemia, preterm delivery and low birth weight.

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