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The incidence and complications of teenage pregnancy at Nongkhai Hospital

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Objective : *This study was aimed to determine the incidence of teenage pregnancy and compare obstetric and neonatal complications of teenage mothers with adult mothers aged 20 - 25 years at Nongkhai Hospital, from January 1st, 2003 to December 31st, 2007.*

Material and Method : *This is a retrospective study conducted at the Department of Obstetrics and Gynecology, Nongkhai Hospital, Thailand. The study group consisted of primigravida women aged 13 - 19 years who delivered at Nongkhai Hospital from January 1st, 2003 to December 31st, 2007. The control group consisted of primigravida women aged 20 - 25 years who delivered during the same period. Demographic, obstetric, and neonatal complications informations were collected and compared between the study and control groups.*

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Results : *The study group consisted of 1,492 women and the control group consisted of 2,816 women. The incidence of teenage primigravida at Nongkhai Hospital was 126 cases per 1,000 mothers. The study group had more no antenatal care and inadequate antenatal care than control group (3.22% vs 1.42% p< 0.001 and 20.84% vs 15.42%, p< 0.001 respectively). The obstetric complications that were higher rate in study group than control group were, namely premature labor (10.79% vs 8.52% p<0.001) and anemia (17.69% vs 11.97% p< 0.001). Vaginal delivery was the major route of delivery in the study group. Low birth weight in the study group was significantly higher than that of the control group. (19.80% vs 12.55% p<0.001)*

Conclusion : *The incidence of teenage pregnancy was 12.6%. Teenage mothers had higher incidence of receiving no antenatal care and inadequate antenatal care. The most common obstetric complications in the teenage pregnancy were preterm labor and anemia. The neonatal complication in teenage pregnancy was low birth weight.*

Keywords : *Teenage pregnancy, Incidence, Complications.*

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สุวิทย์ เด่นศิริอักษร. อุบัติการณ์การตั้งครรภ์และภาวะแทรกซ้อนของสตรีตั้งครรภ์วัยรุ่นใน โรงพยาบาลหนองคาย. จุฬาลงกรณ์เวชสาร 2551 ก.ย. – ต.ค.;52(5): 321 – 30

วัตถุประสงค์ : *เพื่อศึกษาอุบัติการณ์การเกิดทารกของสตรีตั้งครรภ์วัยรุ่นครรภ์แรกที่มาคลอดที่ห้องคลอดโรงพยาบาลหนองคาย ระหว่างวันที่ 1 มกราคม พ.ศ. 2546 ถึง 31 ธันวาคม 2550 และเพื่อศึกษาเปรียบเทียบภาวะแทรกซ้อนของมารดาและทารก ระหว่างสตรีตั้งครรภ์วัยรุ่นและสตรีตั้งครรภ์อายุระหว่าง 20 - 25 ปี*

วัสดุและวิธีการ : *การศึกษานี้เป็นการศึกษาแบบย้อนหลัง กลุ่มศึกษาประกอบด้วย สตรีตั้งครรภ์วัยรุ่นครรภ์แรกอายุระหว่าง 13 - 19 ปี กลุ่มเปรียบเทียบประกอบด้วยสตรีตั้งครรภ์ครรภ์แรก อายุระหว่าง 20 - 25 ปี ที่มาคลอดที่ห้องคลอดโรงพยาบาลหนองคายในช่วงเวลาเดียวกัน โดยทำการศึกษาข้อมูลทั่วไปของมารดาและเปรียบเทียบภาวะแทรกซ้อนของมารดาและทารกระหว่าง 2 กลุ่มศึกษา*

ผลการศึกษา : *กลุ่มศึกษาเป็นสตรีตั้งครรภ์วัยรุ่นทั้งหมด 1,492 คน กลุ่มเปรียบเทียบทั้งหมด 2,816 คน อุบัติการณ์การเกิดทารกของสตรีตั้งครรภ์วัยรุ่นครรภ์แรกพบร้อยละ 12.6% ของสตรีตั้งครรภ์ทั้งหมด ในกลุ่มสตรีตั้งครรภ์วัยรุ่น พบอุบัติการณ์การไม่ฝากครรภ์และการฝากครรภ์ที่ไม่เพียงพอมากกว่ากลุ่มเปรียบเทียบอย่างมีนัยสำคัญ (3.22% vs 1.42% p<0.001และ 20.84% vs 15.42% p<0.001) ภาวะแทรกซ้อนของการตั้งครรภ์ในสตรีตั้งครรภ์วัยรุ่นที่พบมากกว่ากลุ่มเปรียบเทียบอย่างมีนัยสำคัญคือ อัตราการคลอดก่อนกำหนด (10.79% vs 8.52 p<0.001) และภาวะโลหิตจาง (17.69% vs11.97% p<0.001) ส่วนใหญ่ของกลุ่มสตรีวัยรุ่นคลอดปกติ และมีการคลอดทารกแรกคลอดน้ำหนักน้อยกว่ากลุ่มเปรียบเทียบอย่างมีนัยสำคัญ (19.80% vs 12.55% p< 0.001)*

สรุป : *อุบัติการณ์การเกิดทารกของสตรีตั้งครรภ์วัยรุ่นครรภ์แรกที่มาคลอดที่ ห้องคลอดโรงพยาบาลหนองคายพบร้อยละ 12.6 กลุ่มสตรีตั้งครรภ์อายุน้อยไม่ฝากครรภ์และมีการฝากครรภ์ที่ไม่เพียงพอมากกว่ากลุ่มเปรียบเทียบ ภาวะแทรกซ้อนของการตั้งครรภ์ในสตรีตั้งครรภ์วัยรุ่นที่มากกว่ากลุ่มศึกษาเปรียบเทียบคือ อัตราการคลอดก่อนกำหนด และภาวะโลหิตจาง กลุ่มสตรีตั้งครรภ์วัยรุ่นมีการคลอดทารกแรกคลอดน้ำหนักน้อยกว่ากลุ่มศึกษาเปรียบเทียบอย่างมีนัยสำคัญ*

คำสำคัญ : *สตรีตั้งครรภ์วัยรุ่น, อุบัติการณ์, ภาวะแทรกซ้อน.*

During the past decade teenage sexual activity is increasing in Thailand. In 1998 approximately 30% of Thai males and 75% of Thai females aged 15 -18 years were engaged in sexual intercourse, without adequate knowledge about fertility, and infrequent use of contraception.[1] A previous study in a secondary-school students in Nongkhai [2] showed that 5.5% of them had sexual intercourses. The youngest age at which they experienced sexual intercourse was 12 years. During their sexual intercourses, 31.25% of the sample group members did not seek contraception. Their practice were utterly unsafe without any form of contraception or protection against sexually transmitted diseases. This pattern is a source of societal concern, since teenage mothers have an increased risk of having low-birth-weight babies, premature babies, and babies who die during the first year of life.[3, 4]

Adolescent pregnancies are common public health problems, both in the developed (e.g., United States) and developing countries. The adolescent pregnancy rate in the United States was 41.7 births per 1,000 women in 2003. [5] In Thailand, approximately10 percent of teenage girls from 15 to19 years old became pregnant. [6] Thailand's Ministry of Public Health reported the incidence of teenage pregnancy of 104.4, 117.6, 108, and 107 births per 1,000 women in the years 2000, 2001, 2002, and 2003 respectively.[7]

Births of mothers in this age groups have often been associated with adverse pregnancy outcomes, especially low birth weight, small for gestational age (SGA) infants, prematurity, and higher rates of neonatal and postneonatal mortality.[8,9,10] In 2007 the incidence of teenage pregnancy at Nongkhai Hospital was 11%. The aim of this study was to determine the incidence of teenage pregnancy and assess the specific maternal and neonatal complications in teenage pregnancies at Nongkhai Hospital, during the period from January 1st , 2003 to December 31st , 2007.

Material and Method

This retrospective study was conducted at the Department of Obstetrics and Gynecology, Nongkhai Hospital, Thailand. The study group consisted of primigravida women aged 13 - 19 years and the control group consisted of primigravida women aged 20 - 25 years. Both the study and the control groups were consisted of women who delivered at Nongkhai Hospital from January 1st, 2003 to December 31st, 2007. Medical records of both groups were retrieved for review.

The following variables were extracted from medical records; maternal demographic data, maternal age, gestational age at delivery, serological test (including anti HIV, VDRL, HBsAg), hematocrit (first ANC), numbers of antenatal care, route of delivery, obstetric complications (including preterm labor, cephalopelvic disproportion (CPD), fetal distress, premature rupture of membrane (PROM), abnormal presentation, placenta previa, preeclampsia, postpartum hemorrhage (PPH) and neonatal complications (including low birth weight, extremely low birth weight, birth asphyxia and stillbirth).

Statistical analysis was undertaken using SPSS computer software (SPSS Version 12 for Microsoft Windows, SPSS Inc, Chicago, USA). The data were analyzed using descriptive statistics and expressed in terms of mean, standard deviation and percent Chi-

square (or student's test) for comparing mean values. The results were considered to be statistically significant at $p < 0.05$.

Results

During the 5-years study period, the total births at Nongkhai Hospital were 12,789 cases. 1613 teenage pregnancies aged 13 - 19 years old, labored. The incidence of teenage pregnancy aged 13 - 19 years old was 12.6 %. The incidence of teenage pregnancy by year in this study period were 10.9%, 11.61%, 12.65%,13.58% and 14.11%, respectively. There appears to be an increasing in the number of teenage pregnancies. Of the 1,613 teenagers who labored in the study period, 121 were multiparous and were excluded, while 1,492 satisfied the inclusion criteria; and they constituted the study group. In this group, 4,378 (34.23.%) were 20 - 25 years of age. Of the 4,378, 1,563 were multiparous and were then excluded, while the other 2,816 satisfied the inclusion criteria; and they constituted the control group. (Table 1)

The study group had higher levels of inadequate antenatal care (no ANC, less than 4 times) than control group (3.22% vs. 1.42%; p<0.001; 20.84% vs. 15.42%; p<0.001). (Table 2) Maternal demographic data is shown in Table 2.

Route of delivery was shown in Table 3. Cearean section rate in control group was higher than the study group (45.63% vs. 30.90%; p<0.001). When excluded the elective cesarean section criteria, the cearean section rate in control group was also higher than the study group significantly (37.46% vs. 26.88%; p<0.001). Table 4 Obstetric outcomes and neonatal outcomes were shown in Table 5 and Table 6 respectively. Preterm labor was the most common obstetric complication in the study group (10.79% vs. 8.52%; $p < 0.001$). Anemia (Hct < 33%) was significantly different between the two groups (17.69% vs. 11.97%; $p < 0.001$). On the other hand, cephalopelvic disproportion (CPD) rate was higher in the control group than the study group (6.97% vs. 9.34%; $p < 0.001$). The mean birth weight of infants in the study and control groups was 2,920.66 and 2,916.71 grams respectively. Low birth weight (1,500-2,500 grams) was higher in the study group (18.07% vs. 12.38%; $p = 0.003$). Extremely low birth weight (less than 1,500 grams) was higher in the study group (1.73% vs. 0.18%; $p < 0.001$).

Table 1. Birth cases at Nongkhai Hospital in the year 2003 - 2007.

Year	2003	2004	2005	2006	2007	Total
total delivery	2,449 (%)	2,464 (%)	2,592 (%)	2,570 (%)	2,714 (%)	12,789 (%)
age 13 - 19 n (%)	267 (10.90)	286 (11.61)	328 (12.65)	349 (13.58)	383 (14.11)	1,613 (12.6)
Nulliparus	248	263	310	322	349	1,492
Multiparus	19	23	18	27	34	121
age 20 - 25	901 (36.79)	917 (37.22)	853 (32.91)	839 (32.65)	868 (31.98)	4,378 (34.23)
Nulliparus n (%)	550	584	584	520	578	2,816
Multiparus	351	333	269	319	290	1,563

Table 2. Maternal demographic data.

	Study group (n = 1,492)	Control group (n = 2,816)	P-value
Maternal age (years) (mean ± SD)	17.55 + 1.38	22.48 + 1.80	
Weight (Kg) (mean SD)	61.69 + 7.70	64.78 + 10.07	NS
Height (Cm) (mean SD)	156.58 + 5.92	156.45 + 7.46	NS
Hematocrit (%) (mean ± SD)	35.36 + 3.40	36.10 + 3.39	<0.01
VDRL positive n (%)	0 (0)	0 (0)	NS
HIV positive n (%)	5 (0.34)	20 (0.71)	NS
HbsAg positive n (%)	14 (0.94)	32 (1.14)	NS
Antenatal care visit			
No ANC n (%)	48 (3.22)	40 (1.42)	<0.001
ANC < 4 times n (%)	311 (20.84)	434 (15.42)	<0.001
ANC > 4 times n (%)	1,133 (75.94)	2,342 (83.17)	<0.001
Gestational age at delivery (week) (mean ± SD)	38.37 + 2.33	38.58 + 1.87	NS

Data present as mean ± SD and n (percentage)

NS: Not statistically significant

Table 3. Route of delivery.

	Study group (n =1,492)	Control group (n =2,816)	P-value
Normal delivery n (%)	1,010 (67.69)	1,497 (53.16)	<0.001
Operative vaginal delivery n (%)	21 (1.41)	34 (1.21)	NS
Cesarean section n (%)	461 (30.90)	1,285 (45.63)	<0.001

Table 4. Route of delivery when excluded elective cesarean section criteria.

	Study group (n =1,410)	Control group (n =2,448)	P-value
Normal delivery n (%)	1,010 (71.63)	1,497 (61.15)	<0.001
Operative vaginal delivery n (%)	21 (1.49)	34 (1.39)	NS
Cesarean section n (%)	379 (26.88)	917 (37.46)	<0.001

NS: Not statistically significant

Table 5. Obstetric complications.

	Study group (n = 1,492)	Control group (n = 2,816)	P-value
Preterm labor n (%)	161 (10.79)	240 (8.52)	<0.001
Cephalopelvic disproportion (CPD) n (%)	104 (6.97)	263 (9.34)	<0.001
Anemia (Hct < 33%) n (%)	264 (17.69)	337 (11.97)	<0.05
Fetal distress n (%)	41 (2.75)	80 (2.84)	NS
Premature rupture of membrane (PROM) n (%)	20 (1.34)	43 (1.53)	NS
Abnormal presentation n (%)	51 (3.42)	126 (4.47)	NS
Placenta previa n (%)	5 (0.34)	11 (0.39)	NS
Placental apruption n (%)	2 (0.13)	10 (0.36)	
Preeclampsia n (%)	26 (1.74)	114 (4.05)	NS
Multiple gestation n (%)	16 (1.07)	23 (0.82)	NS
Postpartum hemorrhage (PPH) n (%)	15 (1.01)	11 (0.39)	NS
Thick meconium n (%)	27 (1.81)	57 (2.02)	
Oligohydramnios n (%)	28 (1.88)	80 (2.84)	
Medical complication n (%)	8 (0.54)	6 (0.21)	

Data present as mean ± SD and n (percentage)

NS: Not statistically significant

Table 6. Neonatal Complications.

	Study group (n = 1,505)	Control group (n = 2,836)	P-value
Birth weight (grams) mean ± SD	2,920.66 + 527.28	2,916.71 + 629.73	NS
Birth weight <2,500 grams n (%)	298 (19.80)	356 (12.55)	<0.001
Birth weight < 1,500 gram n (%)	26 (1.73)	5 (0.18)	<0.001
Birth weight 1,500 - 2,500 grams n (%)	272 (18.07)	351 (12.38)	0.003
Birth weight > 2,500 grams n (%)	1,207 (80.20)	2,480 (87.45)	<0.001
Apgar score at 1 min < 7 n (%)	21 (1.40)	52 (1.83)	NS
Apgar score at 5 min < 7 n(%)	5 (0.33)	6 (0.21)	NS
Stillbirth (Apgar at 1 min = 0 n (%)	26 (1.73)	7 (025)	NS

Data present as mean ± SD and n (percentage)

NS: Not statistically significant

Discussion

From this study, the incidence of teenage pregnancy was 126 per 1,000 mothers. This is higher than that observed in the study by the Thai Ministry of Public Health, where the incidence rate of Thai teenage pregnancy in the year 2003 was found to be 107 per 1,000 mothers.[7] Nongkhai is located in an rural area which may have lower levels of education than other more urban areas of Thailand, whereby they may have less knowledge about contraception (in order to prevent unwanted pregnancies) than other urban areas. Teenage mothers were also found to have a higher level of no antenatal care and inadequate antenatal care, similar to the findings of Simoes *et al.*[11] A study by Supadit *et al.* showed that low levels of education and inadequate antenatal care increased the risk of low birth weight infants and preterm labor.[12] This study found that teenage mothers had a higher incidence of anemia. The incidence of anemia in teenage pregnancies was 17.69%, similar to that found by Suebnukarn *et al.*[13] and Berenson *et al.* [14] The increased risk of this complication was most likely resulted from poor nutritional[14], habits and low calory intake by teenage mothers. Preterm labor is common complication in teenage pregnancy. The incidence of preterm labor in teenage pregnancies was 10.79%, similar to that observed by Eure *et al.*[15], Suebnukarn *et al.*[13], Hedinger *et al.* [16] and Khunawitikul *et al.*[17] The increased risk of preterm labor may be due to poor nutrition, inadequate antenatal care. Other reasons may be connected to marital and socioeconomic status and lower levels of education. These factors are, however, not considered in this study. In this study, teenage mothers had a higher proportion of normal deliveries compared to adult mothers. This may be due to the fact that teenage mothers give birth to smaller infants than those in the control group. These findings were in accordance with the studies of Ziadeh[18] but this is in contrast to studies of Scholl *et al.* [19] Cesarean section rate was higher among the adult mothers. This may be due to the fact that adult mothers have higher rate of cephalopelvic disproportion (CPD) and elective caesarean sections.

This study found that cephalopelvic disproportion (CPD) was found with higher prevalence in the adult mothers than in the teenage mothers, similar to the finding of Fraser *et al.* and Horon *et al.* [8,20] The significant difference in neonatal outcomes between teenage and adult mothers was low birth weight. This may be due to biological immaturity and poor socioeconomic environment. This finding is consistent with many studies. [1, 14, 21] The problems of teenage pregnancy were to prevent teenager to get pregnant and when teenage pregnant was occurred, early, good and adequate antenatal care must be concerned for good neonatal outcomes.

The disadvantage of this study is that it is retrospective by design study and therefore there is no control over the collection of the data for the purposes of the study. The inability to specify the design of the study means that confounding factors cannot be controlled (i.e factors that are associated with pregnancy outcomes such as smoking and socioeconomic static). Another disadvantage of the study is that our control group may not represent all adult pregnancy (20 to 35 years). Thus, a wider sample would provide a better comparison between adult and teenage pregnancy.

References

1. Isaranurug S, Mosuwan L, Choprapawan C. Differences in socioeconomic status, service utilization, and pregnancy outcomes between teenage and adult mothers. J Med Assoc Thai 2006 Feb; 89 (2) : 145 - 51
2. Densiriaksorn S. Knowledge, attitude and sexual behavior of secondary-school students at Pratumthepivadhayathan School in Nongkhai, Thailand. Chula Med J 2008 Mar - Apr; 52(2): 93 - 106
3. Friede A, Baldwin W, Rhodes PH, Buehler JW, Strauss LT, Smith JC, Hogue CJ. Young maternal age and infant mortality: the role of low birth weight. Public Health Rep 1987 Mar; 102 (2): 192 - 9
4. Brown HL, Fan YD, Gonsoulin WJ. Obstetric complications in young teenagers. South Med J 1991 Jan; 84 (1): 46-8, 64
5. Hamilton BE, Martin JA, Sutton PD. Births: preliminary data for 2003. Natl Vital Stat Rep 2004 Nov; 53 (9): 1 - 17
6. Phupong V. Adolescent pregnancy. In: Phupong V, ed. Reproductive Health in Extreme Ages: How to Approach. Bangkok: Royal Thai College of Obstetricians and Gynecologist, 2005: 180 - 9
7 Ministry of Public Health Bureau of Health Promotion. Maternal and child health status of Thailand in 2002. Nonthaburi: Department of Health, Bureau of Health Promotion, Ministry of Public Health, 2003
8. Fraser AM, Brockert JE, Ward RH. Association of young maternal age with adverse reproductive outcomes. N Engl J Med 1995 Apr; 332(17): 1113 - 7
9. Jolly MC, Sebire N, Harris J, Robinson S, Regan L. Obstetric risks of pregnancy in women less than 18 years old. Obstet Gynecol 2000 Dec; 96 (6): 962 - 6
10. Olausson PM, Cnattingius S, Goldenberg RL. Determinants of poor pregnancy outcomes among teenagers in Sweden. Obstet Gynecol 1997 Mar; 89 (3): 451-7
11. Simoes VM, da Silva AA, Bettiol H, Lamy-Filho F, Tonial SR, Mochel EG. Characteristics of adolescent pregnancy in Sao Luis, Maranhao, Brazil. Rev Saude Publica 2003 Oct; 37 (5): 559 - 65
12. Supadit W, Leelapattana B, Chantayanee B. Teenage pregnancy. R Thai Army Med J 1988 Apr - Jun; 46 (2): 71 - 5
13. Suebnukarn K, Phupong V. Pregnancy outcomes in adolescents < or = 15 years old. J Med Assoc Thai 2005 Dec; 88 (12) : 1758 - 62
14. Berenson AB, Wiemann CM, McCombs SL. Adverse perinatal outcomes in young adolescents. J Reprod Med 1997 Sep; 42(9): 559 - 64
15. Eure CR, Lindsay MK, Graves WL. Risk of adverse pregnancy outcomes in young adolescent parturients in an inner-city hospital. Am J Obstet Gynecol 2002 May; 186 (5): 918 - 20
16. Hediger ML, Scholl TO, Schall JI, Krueger PM. Young maternal age and preterm labor. Ann Epidemiol 1997 Aug; 7(6): 400 - 6
17. Khunavitikul C, Sakulsutawong S. Outcome of Adolescent pregnancy. Chiang Mai Med Bull 1987 Jun; 26(2): 87 - 97
18. Ziadeh S. Obstetric outcome of teenage

pregnancies in North Jordan. Arch Gynecol Obstet 2001 Mar; 265(1): 26 - 9

19. Scholl TO, Hediger ML, Belsky DH. Prenatal care and maternal health during adolescent pregnancy: a review and meta-analysis. J Adolesc Health 1994 Sep; 15(6): 444 - 56

20. Horon IL, Strobino DM, MacDonald HM. Birth weights among infants born to adolescent and young adult women. Am J Obstet Gynecol 1983 Jun; 146(4): 444 - 9

21. Buhachat R, Pinjaroen S. Teenage primigravida and low birthweight delivery. Songklanagarind Med J 1998 Jul - Sep; 16(3): 113 - 22