

# OBSTETRIC OUTCOMES IN NULLIPAROUS YOUNG ADOLESCENTS

Vorapong Phupong and Keng Suebnukarn

Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

**Abstract.** The objective of this study was to determine whether pregnant young adolescents under 15 years of age developed more obstetric complications than adult women. A retrospective case control study was undertaken. The pregnancies of 121 nulliparous women under age 15 delivered at Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University between January 1994 and December 2004 were compared to 121 nulliparous controls age 20-29. Multiple gestations were excluded. Young adolescents were more likely to develop anemia, preterm delivery, preeclampsia and deliver low birth weight neonates. More cases in the young adolescent group did not have antenatal care. Cephalopelvic disproportion occurred less often in the young adolescent group. No differences were observed between the groups regarding the prevalence of premature rupture of membranes, cesarean section, low Apgar score and fetal demise. Adolescents under 15 years of age experienced more obstetric complications than adult women. Development of appropriate education, pregnancy prevention and antenatal care programs is invaluable for adolescents. These programs should target young adolescents who are at increased risk for adverse pregnancy outcomes.

## INTRODUCTION

Adolescent pregnancy is a complex issue affecting families, health care professionals, educators, government officials and the youth themselves. The incidences of adolescent pregnancies in Thailand were 104.4, 117.6, 108, and 107 per 1,000 births in the years 2000, 2001, 2002, and 2003, respectively (Phupong, 2005). This incidence is similar to that reported by our institute (82.8-113.3 per 1,000 births) (Anonymous, 2003). Although adolescent pregnancies and birth rates have been steadily decreasing, many adolescents still become pregnant.

---

Correspondence: Dr Vorapong Phupong, Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, Rama IV Road, Pathumwan, Bangkok 10330, Thailand.  
Tel: 66 (0) 2256-4241; Fax: 66 (0) 2254-9292  
E-mail: vorapong.p@chula.ac.th

Adolescent pregnancies are considered high risk for both the mother and fetus. Several authors in Caucasian and Asian countries report an increased incidence of obstetric complications in adolescent pregnancies, such as increased pregnancy induced hypertension, low birth weight, preterm delivery, anemia, and intrauterine growth retardation (IUGR) (Bozkaya *et al*, 1996; DuPlessis *et al*, 1997; Lao and Ho, 1997; Pal *et al*, 1997). Some authors report that the increased risk is not due to the adolescence but to poor antenatal care (Mahfouz *et al*, 1995). It is also a common belief that adolescent parturients more frequently experience cephalopelvic disproportion (CPD) as a result of incomplete development of the bony pelvis (ACOG, 1993). This risk is even greater for teens who are less than 15 years old (ACOG, 1993). Some studies show increase cesarean section rates in adolescent patients (Khawaja *et al*, 1986; Konje *et al*, 1992), some studies show

lower cesarean section rates (Brown *et al*, 1991; Weerasekera, 1997).

The aim of this study was to compare several obstetric characteristics and outcomes of nulliparous women under age 15 to those of matched nulliparous women age 20-29 delivered at a tertiary care hospital.

## MATERIALS AND METHODS

The medical charts of nulliparous women who were younger than 15 years of age at the time of delivery and who delivered at the Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University from January 1, 1994 to December 31, 2004 were reviewed retrospectively. Twin gestations were excluded from the study. The number of participants in the study group remained at 121. This was a retrospective case-control study in which 121 women age 20-29 who delivered a single child were matched for race, infant gender, and year of delivery. Matches were determined by computer random number using eligible controls delivered during the study period.

Information was obtained from each of the 242 medical records regarding age, antenatal care, gestational age at delivery, total weight gain, obstetric complications, mode of delivery, immediate neonatal outcome, and postpartum complications. Gestational age was assigned based on the last menstrual period (LMP) if confirmed by ultrasound, or ultrasound alone when LMP was unknown. Anemia was defined as a hemoglobin less than 11 g/dl in the first and third trimesters or less than 10.5 g/dl in the second trimester. Preterm delivery was defined as delivery before 37 completed weeks of gestation. Premature rupture of membranes (PROM) was defined as rupture of membranes before onset of labor. Preeclampsia was defined as a blood pressure of at least 140/90 mmHg measured on two occasions six hours apart, accompanied

by proteinuria of at least 300 mg per 24 hours, or at least 1+ on dipstick testing (ACOG, 2002). Severe preeclampsia was defined as having one or more of the following criteria: blood pressure of at least 160/110 mmHg measured on two occasions six hours apart, proteinuria of at least 5 g per 24 hours, or at least 3+ on dipstick testing, oliguria of less than 500 ml per 24 hours, cerebral or visual disturbances, pulmonary edema or cyanosis, epigastric or right upper quadrant pain, impaired liver function, thrombocytopenia, or fetal growth restriction (ACOG, 2002). Fetal growth restriction or small for gestational age (SGA) infant was defined as a newborn birth weight less than 10 percentile for gestational age (ACOG, 2001).

Statistical analysis was performed with the SPSS software package version 12.0 for Windows (SPSS Inc, Chicago, USA). Continuous variables were compared with the unpaired Student's *t*-test while the  $\chi^2$  test (or Fisher exact tests when appropriate) were used to compare the frequencies of outcomes. Significance was defined as a p-value <0.05 or a 95% confidence interval (CI) that did not include 1.

## RESULTS

The mean  $\pm$  standard deviation ages in the study and control groups were 13.7 $\pm$ 0.5 and 24.7 $\pm$ 2.1 years, respectively. Table 1 presents the demographic characteristics of the subjects. The mean gestational age at delivery was lower in the study group than the control group (37.2 $\pm$ 2.4 vs 38.6 $\pm$ 1.5 weeks,  $p$ <0.05). The total weight gain during pregnancy, number of antenatal visits, and neonatal birth weight were significantly lower in the study group than control group (12.0 $\pm$ 5.7 vs 15.5 $\pm$ 5.4 kgs, 4.0 $\pm$ 2.9 vs 8.2 $\pm$ 3.1 times, and 2,801.9 $\pm$ 487.1 vs 3,045.3 $\pm$ 467.6 grams,  $p$ <0.05, respectively).

Young adolescents were significantly more likely than control subjects to have ane-

Table 1  
Demographic characteristics and antenatal data.

	Adolescents (n=121)	Controls (n=121)	p-value
Age (years)	13.7±0.5	24.7±2.1	< 0.05
Gestational age (weeks)	37.2±2.4	38.6±1.5	< 0.05
Total weight gain (kgs)	12.0±5.7	15.5±5.4	< 0.05
Hematocrit (%)	34.8±4.9	35.9±3.9	NS
Number of antenatal visits (times)	4.0±2.9	8.2±3.1	< 0.05
Cases with no antenatal care	18 (14.9%)	3 (2.5%)	< 0.05

Results are shown as mean±SD or n (%).

Table 2  
Maternal outcomes and complications of young adolescents versus control subjects.

	Adolescent (n=121)	Controls (n=121)	Odds ratio (95% CI)	p-value
Anemia	20 (16.5%)	8 (6.6%)	2.8 (1.2-6.6)	< 0.05
Preterm delivery	24 (19.8%)	8 (6.6%)	3.59 (1.5-8.1)	< 0.05
Preeclampsia	10 (8.3%)	2 (1.7%)	5.4 (1.2-25)	< 0.05
CPD	5 (4.1%)	14 (11.6%)	0.3 (0.1-1.0)	< 0.05
PROM	4 (3.3%)	8 (6.6%)	0.5 (0.1-1.7)	NS
PPH	4 (3.3%)	1 (0.8%)	4.1 (0.5-37.3)	NS
Fetal distress	3 (2.5%)	1 (0.8%)	3.1 (0.3-29.8)	NS
Route of delivery				
Normal delivery	87 (71.9%)	64 (52.9%)	2.3 (1.3-4.0)	< 0.05
Cesarean section	11 (9.1%)	39 (32.2%)	0.2 (0.1-0.4)	< 0.05
Operative vaginal delivery	23 (19%)	18 (14.9%)	1.3 (0.7-2.8)	NS

Results are shown as n (%); PPH: postpartum hemorrhage

mia, preterm delivery, preeclampsia, and SGA infants. In addition, they were significant less likely than controls to deliver by cesarean section (Tables 2, 3). CPD occurred less often in young adolescents than controls (Table 2).

## DISCUSSION

This study examines the questions surrounding the obstetric outcomes of the young adolescents. Both the young adolescent and control groups consisted of nulliparous women, removing the potential confounding variables of multiparity and previous cesarean section. In this study, we found that young

adolescents were at increased risk for adverse pregnancy outcomes compared with older controls. Our findings of an increased risk of adverse pregnancy outcomes, such as anemia, preterm delivery, preeclampsia, and SGA infants in young adolescents are similar to the results of other Caucasian and Asian studies (Satin *et al*, 1994; Verma and Das, 1997; Eure *et al*, 2002).

The subjects in this study did not have a cesarean section rate higher than the controls. Other authors have suggested that adolescents under 15 years of age are at increased risk for CPD since the bony pelvis has not reached its full size at that age (Hassan and Falls, 1964;

Table 3  
Neonatal outcomes in young adolescents versus control subjects.

	Adolescent (n=121)	Controls (n=121)	Odds ratio (95% CI)	p-value
Apgar <7 at 1 minute	5 (4.1%)	2 (1.7%)	2.6 (0.5-13.5)	NS
Apgar <7 at 5 minutes	1 (0.8%)	1 (0.8%)	1 (0.1-16.2)	NS
SGA	9 (7.4%)	2 (1.7%)	4.8 (1.2-22.6)	< 0.05
FDU	1 (0.8%)	1 (0.8%)	1 (0.1-16.2)	NS
Still birth	2 (1.6%)	1 (0.8%)	2.0 (0.2-22.5)	NS

Results are shown as n (%); FDU: fetal death in utero

Duenhoelter *et al*, 1975). Recent studies (Berenson *et al*, 1997; Satin *et al*, 1994; Eure *et al*, 2002) have not supported this assumption. These studies suggest that while physical growth and maturation are not complete until well into the teenage years, the risk of CPD is not affected by age. The other reasons for the lower cesarean section rate in young adolescents in the present study when compared to the controls may be due to more cases of preterm delivery and small for gestational age infants in the subjects.

The subjects in this study were at increased risk for anemia, preeclampsia, preterm delivery and SGA infants, similar to previous reports from India (Verma and Das, 1997). Lao and Ho (1997) from Hong Kong, reported an increased incidence in preterm delivery and low birth weight in teenagers. Moini *et al* 2002 from Iran, reported an increased incidence in preterm delivery in teenagers. Pal *et al* (1997) from India, found anemia to be a complication in teenagers. The slight differences observed among reports from Asian populations may be due to racial characteristics or regional differences in the risk factors influencing teenage pregnancies. These risk factors include intention to be pregnant, smoking during pregnancy, low education, and lack of appropriate antenatal care. We found a greater number of cases with no antenatal care in subjects than in controls.

In conclusion, adolescents under 15

years of age experience more obstetric complications than adult women. Development of appropriate education, pregnancy prevention and antenatal care programs is invaluable in adolescents. These programs should target young adolescents who are at increased risk for adverse pregnancy outcomes.

## REFERENCES

- American College of Obstetricians and Gynecologists (ACOG). Special needs for pregnant teens. *ACOG Patient Edu Bull* 1993; AP103.
- American College of Obstetricians and Gynecologists (ACOG). Intrauterine growth restriction. Clinical management guidelines for obstetrician-gynecologists. *Int J Gynaecol Obstet* 2001; 72: 85-96.
- American College of Obstetricians and Gynecologists (ACOG). ACOG practice bulletin. Diagnosis and management of preeclampsia and eclampsia. Number 33, January 2002. *Int J Gynaecol Obstet* 2002; 77: 67-75.
- Anonymous. Obstetric audit; statistical report 1996-2002 A.D. Bangkok: Department of Obstetrics and Gynecology, Faculty of Medicine, Chulalongkorn University, 2003.
- Berenson AB, Wiemann CM, McCombs SL. Adverse perinatal outcomes in young adolescents. *J Reprod Med* 1997; 42: 559-64.
- Bozkaya H, Mocan H, Usluca H, Beser E, Gumustekin D. A retrospective analysis of adolescent pregnancies. *Gynecol Obstet Invest* 1996; 42: 146-50.
- Brown HL, Fan YD, Gonsoulin WJ. Obstetric com-

- plications in young teenagers. *South Med J* 1991; 84: 46-8, 64.
- Duenhoelter JH, Jimenez JM, Baumann G. Pregnancy performance of patients under fifteen years of age. *Obstet Gynecol* 1975; 46: 49-52.
- DuPlessis HM, Bell R, Richards T. Adolescent pregnancy: understanding the impact of age and race on outcomes. *J Adolesc Health* 1997; 20: 187-97.
- 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; 186: 918-20.
- Hassan HM, Falls FH. The young primipara. A clinical study. *Am J Obstet Gynecol* 1964; 88: 256-9.
- Khwaja SS, Al-Sibai MH, Al-Suleiman SA, el-Zibdeh MY. Obstetric implications of pregnancy in adolescence. *Acta Obstet Gynecol Scand* 1986; 65: 57-61.
- Konje JC, Palmer A, Watson A, Hay DM, Imrie A, Ewings P. Early teenage pregnancies in Hull. *Br J Obstet Gynaecol* 1992; 99: 969-73.
- Lao TT, Ho LF. The obstetric implications of teenage pregnancy. *Hum Reprod* 1997; 12: 2303-5.
- Mahfouz AA, el-Said MM, al-Erian RA, Hamid AM. Teenage pregnancy: are teenagers a high risk group? *Eur J Obstet Gynecol Reprod Biol* 1995; 59: 17-20.
- Moini A, Riazi K, Mehrparvar AH. Pregnancy and labor complications in teenagers in Tehran. *Int J Gynaecol Obstet* 2002; 78: 245-7.
- Pal A, Gupta KB, Randhawa I. Adolescent pregnancy: a high risk group. *J Indian Med Assoc* 1997; 95: 127-8.
- Phupong V. Adolescent pregnancy. Reproductive health in extreme ages: how to approach? Bangkok: Royal Thai College of Obstetricians and Gynecologist, 2005: 180-96.
- Satin AJ, Leveno KJ, Sherman ML, Reedy NJ, Lowe TW, McIntire DD. Maternal youth and pregnancy outcomes: middle school versus high school age groups compared with women beyond the teen years. *Am J Obstet Gynecol* 1994; 171: 184-7.
- Verma V, Das KB. Teenage primigravidae: a comparative study. *Indian J Public Health* 1997; 41: 52-5.
- Weerasekera DS. Adolescent pregnancies—is the outcome different? *Ceylon Med J* 1997; 42: 16-7.