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Obstetric and perinatal outcome in teenage pregnancies

S Sulaiman,[1] MB BCh, MMed (O&G); **S Othman**,[2] MBBS, MMed (Family Medicine); **N Razali**,[1] MBBS, MMed (O&G); **J Hassan**,[1] MBBS, MMed (O&G)

[1] *Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia*
[2] *Department of Primary Care Medicine, Faculty of Medicine, University of Malaya, Kuala Lumpur, Malaysia*

Corresponding author: *S Sulaiman (sofiahsulaiman@gmail.com)*

Objective. To compare obstetric and perinatal outcome in teenage and non-teenage pregnancies.
Methods. We performed a retrospective analysis of case records of teenage pregnancies from January 2006 to December 2008. The subjects gave birth in the Department of Obstetrics and Gynaecology, University of Malaya Medical Centre, Kuala Lumpur, Malaysia, a referral tertiary care and teaching hospital with over 5 000 deliveries annually. Pregnancy outcomes in girls aged ≤19 years were compared with those in women aged >19 years. A total of 177 teenage pregnancies were compared with 200 pregnancies in older women.
Results. The prevalence of teenage pregnancies was 1.1%. Almost all subjects were in their first pregnancies. The study showed that teenage mothers had a significant risk of delivering low-birth-weight babies. There were no differences in the risk of anaemia, severe pre-eclampsia, caesarean delivery, postpartum haemorrhage or fetal distress in labour compared with the 200 women in the older age group. Of the pregnant teenagers, 26.9% did not receive any antenatal care at all.
Conclusion. The findings suggest that the long-held beliefs about the risks related to teenage pregnancy are not all justified. Early booking, adequate antenatal care and delivery by trained personnel should improve the obstetric and perinatal outcome in this age group.

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Teenage pregnancy has traditionally been considered high-risk pregnancy, especially in developing countries. According to World Health Organization data, about half of the world's population is under 25 years old, 1.8 billion are aged 10 - 25 years, and 88% live in the developing world.[1] In Malaysia, the birth rate for 15 - 19-year-old girls in 2008 was an alarming 12.7/1 000 population.[2]

Factors that may contribute to this problem are lack of education and information about reproductive and sexual health, lack of access to ways to prevent pregnancy, adolescent sexual behaviour, and even certain customs and traditions. Teenage pregnancy has been reported to be associated with an increased risk of pregnancy-induced hypertension, premature labour and anaemia.[3-5] The underdeveloped pelvis in younger adolescents can mean that they have more difficulties in childbirth than adults or mature adolescents, who have fully developed bone structure. Research also indicates that pregnant adolescents are less likely to receive prenatal care than older women, often seeking it only in the third trimester, if at all.[6] In this study,[6] low birth weight was the only significant difference between the two age groups, and it was related to non-utilisation of prenatal care rather than biological age.

Our objective was to examine the prevalence and obstetric and perinatal outcome of teenage pregnancies at the University of Malaya Medical Centre (UMMC), Kuala Lumpur, Malaysia, over the 3-year period January 2006 - December 2008.

Information on teenage pregnancy in Malaysia is scarce. Studies so far have been on a small scale, with teenage pregnancy being researched not as the main topic, but as one aspect of high-risk pregnancy. We used data from the UMMC to systematically explore current aspects of teenage pregnancy, with the intention of informing and improving healthcare services for these young mothers.

Methods

This was a retrospective study conducted in the Department of Obstetrics and Gynaecology, UMMC. All the medical records from the hospital delivery database were reviewed and all case records of adolescents (age ≤19 years) who delivered at the UMMC from January 2006 to December 2008 were retrieved, together with 200 case records of adult women (age >19 years) who delivered a single infant over the same time period. These controls were matched with the adolescent cases by computer random number generation.

The following variables were extracted from the medical records: maternal age, gestational age at delivery, mode of delivery, obstetric complications, socio-demographic background, number of antenatal visits during the pregnancy, and perinatal complications including low birth weight and stillbirth. The teenage pregnancies were compared with the non-teenage pregnancies.

Anaemia was defined as a haemoglobin concentration <11 g/dl, and preterm delivery was defined as delivery before 37 weeks' gestation or amenorrhoea. Numbers of deliveries before 34 weeks of amenorrhoea were also noted. Pre-eclampsia was defined as a blood pressure of at least 140/90 mmHg measured on two occasions 6 hours apart, accompanied by proteinuria of at least 300 mg/24 h, or at least 1+ on dipstick testing. Small-for-gestational-age (SGA) infants were defined as those weighing <2 500 g.

Statistical analysis was undertaken using SPSS version 17. Data were analysed using descriptive statistics and expressed as means ±standard deviations. The chi-square test or Student's *t*-test was used for comparing mean values. Results were considered to be statistically significant at $p<0.05$.

The research proposal was approved by the ethical committee of the UMMC.

Results

Of 15 680 women who gave birth during the 3-year study period, 177 were adolescents, giving a teenage pregnancy rate of 1.1%. The mean age of the adolescents was 17.6 years, and 108 (62.0%) were aged >18 years at the time of delivery. Only 7 (4.0%) were aged <15 years, and 62 (35.0%) were between 15 and 18 years old. Table 1 presents the demographic characteristics of the subjects and the antenatal care they had received.

There were 2 miscarriages and 1 stillbirth. The latter was estimated to have been at between 26 and 28 weeks of amenorrhoea (the patient was unsure of her dates and there were insufficient antenatal data).

The mean gestational age at delivery for the adolescents was premature (<37 weeks), and the adolescents gave birth significantly earlier than the control group; nearly a quarter (24.3%) had preterm deliveries, compared with less than 10% of adults. However, only 13 adolescents (7.0%) delivered at less than 34 weeks' gestation. The rate of low birth weight was also much higher (24.1%) in the teenage group than in the adult group (7.0%). Moreover, 4.5% of teenage mothers delivered babies of very low birth weight (<1 500 g).

At the time of delivery, 115 (65.0%) of the adolescents were married and 62 (35.0%) were single. In contrast, only 5 women in the adult group were not married. The majority (62.1%) of the adolescents lived with their husbands, 19.8% with their parents, and smaller numbers with a partner (3.9%), relatives (3.4%) or friends (3.4%), or in a shelter (2.8%).

As would be expected, the majority (85.3%) of the adolescents were nulliparous, compared with less than half of the adult women. However, 24 of them (13.6%) of them were para 1 or had previously had miscarriages, and 2 (1.1%) were para 2.

Over a quarter (26.9%) of the pregnant adolescents who did not miscarry (*N*=175) had not received any antenatal care before presenting to the UMMC to deliver their babies. More than half (54.3%) had had at least one antenatal visit at the UMMC before delivery, and the remainder had sought care from private clinics. However, 59 (62.1%) of those who came to the UMMC for antenatal care presented in the third trimester shortly before delivery; effectively, they are considered to have had inadequate antenatal care. Only 1 adolescent who received antenatal care at the UMMC (1.1%) did so in the first trimester. In contrast, only 12.5% of adult women had no antenatal care at all.

Interestingly, teenage pregnancies in this study were not associated with significantly higher rates of postpartum haemorrhage, pre-eclampsia or fetal distress compared with adult pregnancies (Table 2). In addition, the proportion of adolescents diagnosed with anaemia was considerably lower than that of adults.

Discussion

Teenage pregnancy in developed countries usually occurs outside marriage, and in many communities and cultures carries a social stigma. In other countries and cultures, particularly in the developing world, teenage pregnancy is often within marriage and does not involve social stigma.[7] In this study, the majority of the adolescents were over 18 years of age, followed by age 15 - 18 years, and only 4.0% were <15 years old at delivery. The majority were married, and most lived with their husbands or parents. These girls tended to fall into the group who attended several times for antenatal care.

The prevalence of teenage pregnancy over the 3-year study period was 1.1%. This is lower than global figures.[7] It is speculated that actual figures may be much higher, because many such pregnancies go unreported. Full data on pregnancies are only available if the mother attends antenatal care.

Table 1. Demographic and antenatal backgrounds of the study and control groups

Variable	Adolescents (10 - 19 years) (*N*=177)	Adults (>19 years) (*N*=200)	*p*-value
Maternal age (years), mean (±SD) (median)	17.63 (±1.5) (18)	29.6 (±4.5) (29)	<0.0001
Marital status, *n* (%)			<0.0001
Married	115 (65.0)	195 (97.5)	
Single	62 (35.0)	5 (2.5)	
Parity			<0.0001*
0	151 (85.3)	74 (37.0)	
1	24 (13.6)	52 (26.0)	
≥2	2 (1.1)	74 (37.0)	
Antenatal care visits, *n* (%)			<0.0001
Sub-total (live births + stillbirth)	175		
None	47 (26.9)	25 (12.5)	
≥1 (UMMC)	95 (54.3)	175 (87.5)	
≥1 (other sources)	33 (18.9)	0	
Hb status, *n* (%)			-
Anaemia (Hb <11 g/dl)	32 (18.1)	58 (29.0)	
Normal	141 (79.7)	136 (68.0)	
Missing information	4 (2.3)	6 (3.0)	

SD = standard deviation; UMMC = University of Malaya Medical Centre; Hb = haemoglobin.

*Statistically significant difference in distribution by parity (para 0 v. ≥1); - = no statistical test done owing to missing data.

Table 2. Outcomes and complications in the study and control groups

Variable	Adolescents (10 - 19 years) (*N*=177)	Adults (>19 years) (*N*=200)	*p*-value
Birth outcome, *n* (%)			-
Live birth	174 (98.3)	199 (99.5)	
Stillbirth	1 (0.6)	0	
Miscarriage	2 (1.1)	1 (0.5)	
Preterm delivery, *n* (%)	43 (24.3)	19 (9.5)	<0.001
Gestational age at delivery (weeks), mean (±SD)	36.5 (±8.0)	38.5 (±2.0)	0.0005
Pre-eclampsia, *n* (%)	2 (1.1)	2 (1.0)	-
PPH, *n* (%)	0 (0)	5 (2.5)	-
LBW (<2 500 g), *n* (% of live births)	42 (24.1)	14 (7.0)	<0.0001
Birth weight (g), mean (±SD)	2 718 (±660)	3 047 (±454)	<0.0001
Fetal distress, *n* (%)	8 (4.5%)	18 (9%)	NS
Mode of delivery, *n* (% of live births)			0.01
Vaginal	155 (89.0)	157 (78.9)	
Caesarean section	19 (10.9)	42 (21.1)	

SD = standard deviation; PPH = postpartum haemorrhage; LBW = low birth weight; - = no statistical test done owing to zero cells or small numbers; NS = not statistically significant at $p<0.05$.

Studies on teenage pregnancies have shown conflicting results. Most studies have demonstrated an increased risk of pregnancy-induced hypertension, anaemia and premature labour.[2,3,8,9] The present study showed an increased risk of preterm delivery, low birth weight and SGA infants. Further analysis showed that only 7.0% of adolescents gave birth before 34 weeks' gestation. In contrast, no significant differences were seen in the prevalences of anaemia, postpartum haemorrhage and pregnancy-induced hypertension/pre-eclampsia between the adolescents and the adult group. These findings are similar to those in a recent study by Sagili *et al.*[10] A possible explanation is that the majority of our subjects were married (65.0%) and older teenagers (62.0%).

We found that teenage mothers tend to produce babies of low birth weight. This may have a significant health impact in future years with regard to coronary artery disease, hypertension and type 2 diabetes. The intra-uterine environment and intra-uterine exposures have been found to play an important role in lifelong health and disease, awareness of their importance having emerged nearly 50 years ago when a study by Rose[11] described a family pattern of coronary heart disease (CHD), stillbirth and infant mortality. Barker and colleagues[12,13] subsequently made extensive investigations, found high rates of death due to CHD in areas of England and Wales with high neonatal mortality, and proposed that intra-uterine deprivation was an important factor. However, in our study it was not possible to distinguish the causes of low birth weight in teenage pregnancy with certainty.

Many other studies have documented associations between low birth weight and increased incidences of heart disease, hypertension and type 2 diabetes, as well as relevant markers such as abnormal glucose-insulin metabolism and serum cholesterol concentrations.[13-17] It is difficult to determine whether the lower birth weight babies born to the adolescents in this study were growth-restricted or premature, because almost half (80; 45.7%) of the subjects who did not miscarry (*N*=175) first presented to the UMMC in labour, having either had no antenatal visits at all or antenatal visits elsewhere. Of those who attended the UMMC antenatal clinic (*N*=95), 59 (62.1%) did so for the first time shortly before delivery, and 12 (12.6%) had only one antenatal visit in the third trimester.

Teenage pregnancies tend to be unplanned, and unplanned pregnancies in young adults are at the root of a number of important public health and social challenges. Women who have an unplanned pregnancy are less likely to obtain prenatal care than women whose pregnancies are planned, and their babies are at an increased risk of low birth weight and premature birth. This is borne out by the present study, in which almost half (45.7%) of the pregnant adolescents presented for the first time for delivery at the UMMC.

We also found that a significantly higher percentage of teenage subjects (26.9%) than older women (12.5%) did not make any antenatal visits at all. The teenage patients also had significantly fewer antenatal visits compared with the older age group. These findings may be related to the psychological stress of an unplanned pregnancy and lack of family support. In this regard, studies have shown that *in utero* exposure to maternal stress may have long-term negative physiological consequences and can directly influence adult health, even in the absence of low birth weight.[18] Furthermore, Buss *et al.*[18] evaluated brain morphology in young adults and found an association between birth weight and the postnatal environment. Lower birth weight was associated with smaller hippocampal volume (a well-established risk factor for depression and psychopathology) only in individuals exposed to postnatal adversity (poor parental bonding). Swanson and Wadhwa[19] have suggested that the fetal environment plays an important role in the development of structure and function of body organs, and may also be relevant to the origins of some child mental health disorders.

Our study showed that the adolescents had a significantly higher rate of normal vaginal delivery and a lower caesarean section rate compared with the adult group. It has been postulated that the young adolescent is at increased risk for cephalopelvic disproportion because the bony pelvis has not yet reached its full size. However, the majority of the teenagers in this study were not young adolescents but late teenagers with full bone maturity, which could explain the lower caesarean section rate in the study group compared with the controls. Recent studies have not supported

the assumption that teenage pregnancy is associated with adverse outcome.[10,20,21] However, our adolescent mothers had more preterm deliveries and more SGA infants than the adult group.

Conclusion

Teenage pregnancy is an unresolved problem in developing countries, despite various forms of sexual education and contraceptive advice. This study showed that the risk of obstetric complications was no higher in adolescents than in adult women, but that adolescents tended to have less antenatal care and to deliver smaller babies. Good family support, early booking and adequate antenatal care should improve the obstetric and perinatal outcome in teenage pregnancies.

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