ORIGINAL

OBSTETRIC AND PERINATAL OUTCOMES IN MULTIPAROUS ADOLESCENTS

RESULTADOS OBSTÉTRICOS E PERINATAIS ENTRE ADOLESCENTES MULTÍPARAS

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ABSTRACT

Objective

To compare the obstetric and perinatal outcome of multiparous adolescents with two control groups: primiparous adolescents and multiparous adults.

Methods

A total of 199 multiparous adolescents were compared to 398 primiparous adolescents and 398 multiparous adults. The presence of chronic diseases, stillbirths, twins and fetal malformation were exclusion criteria. Statistical analysis was performed using Chi-squared test, Student's "t" test for independent samples and multiple logistic regression.

Results

The percentage of small-for-gestational age newborns was significantly higher among multiparous adolescents (7.3%) than among multiparous adults (3.6%). Multiple logistic regression analysis determined that only variables significantly associated with risk for small-for-gestational age newborns were young maternal age and low number of prenatal visits (*Odds Ratio*=2.119 and *Odds Ratio*= 0.311).

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Conclusion

Multiparous adolescents presented similar obstetric and perinatal outcomes when compared to primiparous adolescents and multiparous adults except for the frequency of small-for-gestational age newborns infants, which was significantly higher among multiparous adolescents than among adults. Maternal age ≤19 years and low number of prenatal visits were the variables associated with the risk for small-for-gestational age newborns.

Indexing terms: pregnancy in adolescence, prenatal care, reproductive medicine.

RESUMO

Objetivo

Comparar os resultados obstétricos e perinatais de adolescentes multíparas com dois grupos de gestantes: adolescentes primíparas e adultas multíparas.

Métodos

O estudo incluiu 199 adolescentes multíparas, que foram comparadas com 398 adolescentes primíparas e 398 adultas multíparas. Os critérios de exclusão foram: presença de doença materna crônica, natimorto, gestação gemelar e malformação fetal. A análise estatística incluiu o teste qui-quadrado, o teste "t" de Student para amostras independentes e análise múltipla por regressão logística.

Resultados

*A porcentagem de recém-nascidos pequenos para a idade gestacional foi significativamente maior entre adolescentes multíparas (7,3%) do que entre adultas multíparas (3,6%), sendo que as únicas variáveis significativamente associadas ao risco para recém-nascidos pequenos para a idade gestacional foram idade materna ≤19 anos e pequeno número de consultas pré-natais (*Odds Ratio=*2,119 e* Odds Ratio= *0,311).*

Conclusão

Adolescentes multíparas apresentaram desempenho obstétrico e perinatal semelhante às adolescentes primíparas e adultas multíparas, exceto pela freqüência de recém-nascidos pequenos para a idade gestacional, que foi significativamente maior entre adolescentes multíparas quando comparadas com adultas multíparas. A idade materna ≤19 anos e o pequeno número de consultas pré-natal foram as únicas variáveis associadas ao risco para recém-nascidos pequenos para a idade gestacional.

Termos de indexação*: cuidado pré-natal, gravidez na adolescência, medicina reprodutiva.*

INTRODUCTION

Pregnancy in adolescence is a major public health problem in Brazil. Data from Brazil as a whole have shown that 23.3% of all public sector deliveries in 2001 were carried out in women <20 years old[1]. Pregnant teenagers may face a variety of medical, emotional and social problems during pregnancy and in later life, and pregnancy at a young age is a marker for future sexual risk behavior and adverse outcomes, including high rates of Sexually Transmitted Infections and repeat pregnancy[2].

In the USA, data from the National Longitudinal Survey of Youth reveal that approximately one-quarter of teenage mothers go on to have a second child within 24 months of their first delivery. The prevalence[3] of closely-spaced second births is greatest (31%) among young women whose

first birth occurred prior to age 17. In 1996, Brazilian demographic data demonstrated that 10.4% of women of 19 years of age had at least 2 children[4]. On the other hand, repeat pregnancies during adolescence are related to socioeconomic dependence and lower education levels[5].

Repeat pregnancy has been described as one the main determinant factor of worse outcome of adolescent pregnancy, particularly when the second pregnancy occurs within 24 months of the first one[6]. Studies have shown that multiparous adolescents tend to have less prenatal care than primiparous adolescents or older women[5,7,8]. Although data are controversial, some authors have suggested that multiparous adolescents may be at greater risk of certain perinatal problems such as: small-for-gestational-age neonates (SGA), low birth weight, very low birth weight, lower mean birth weight than older women, and preterm birth[9-11].

The objective of this study was to assess the association between repeat adolescent pregnancy and obstetric outcome in a group of Brazilian adolescents, and to contribute towards establishing public health policies with respect to this problem.

METHODS

This retrospective cohort study was conducted at the Obstetrics Unit of the Department of Obstetrics and Gynecology, School of Medicine, State University of *Campinas* (*Unicamp*), Brazil, between January 1994 and December 1996. The research protocol was approved by the Ethics Committee of the Department of Obstetrics and Gynecology, School of Medical Sciences, State University of *Campinas* (*Unicamp*), in May 1997.

The study included a group of 199 pregnant women of 19 years of age or less, who had at least one previous delivery between January 1994 and December 1996, and two control groups. In each control group, two women were selected as controls for each subject in the multiparous adolescent group, one who had given birth just before the subject and the other immediately after. The first control group included 398 primiparous adolescents aged 19 or less. The second control group included 398 women of 20 to 29 years of age, who had the same parity as the corresponding subject. Pregnant women with stillborn infants, twins, fetal malformation or chronic clinical diseases were excluded.

Each woman receiving care at the hospital receives a pre-coded obstetrics record, which is filled out at the time each event occurs. For this study, the following variables from the obstetrics record were selected: age at delivery, number of deliveries, prenatal care (number of prenatal visits), educational level, marital status, number of previous abortions, number of previous cesarean sections, number of living children, number of dead children, interval between deliveries, weight gain (defined as the difference between the weight at the end of the pregnancy and the pre-pregnancy weight), gestational hypertension (defined as blood pressure levels ≥140/90mmHg at two different measurements), hemorrhage during pregnancy, type of delivery, C-section indication, gestational age, neonatal weight, adequacy of neonatal weight for gestational age, puerperal infection, puerperal hemorrhage, and neonatal evolution (live or dead child).

Epi Info 6.0 was used to calculate sample size, estimating a frequency of low birth weight of 22% among multiparous adolescents in our service[12] and 6% among multiparous adults[7]. The sample size was calculated at 139 subjects, admitting a type I error of .05 and a type II error of 0.2.

Dataset was created using Epi Info 6.0. After reviewing and cleaning the data, it was exported to the SAS program for analysis.

Statistical analysis included Student's t test for independent samples and the Chi-squared test for univariate analysis. Two models were used for multiple logistic regression analysis. The first included only multiparous and primiparous adolescents, and was carried out to determine the association between parity and the following dependent variables: gestational hypertension, C-section, gestational age <37 weeks, low birth weight and SGA neonate. The

probability test was performed, followed by logistic regression adjusted using stepwise selection. The second model included all multiparas (adolescents and adults) and was carried out to evaluate the association between maternal age and parity considering the following dependent variables: gestational hypertension, C-section delivery, gestational age <37 weeks, neonatal weight <2,500 grams and SGA neonates. The model applied was the same as in model[13,14].

RESULTS

The mean maternal age of the group of multiparous adolescents was significantly higher (18.0 ± 1.1 years) than that of the group of primiparas (16.9 ± 1.6 years). The mean maternal age of the group of adults was 23.7 ± 2.8 years. As shown in Table 1, the percentage of women with no partner was higher among primiparous adolescents when compared to multiparous adolescents (39.5% and 24.6%, respectively) and higher among multiparous adolescents when compared to multiparous adults (24.6% and 14.9%, respectively). Multiparous adolescents had a significantly lower education level than women in the other groups. The percentage of pregnant women who had attended 5 or more prenatal consultations was significantly lower among multiparous adolescents than among primiparous adolescents or adults (57.7%, 74.7% and 76.1%, respectively). In addition, a smaller percentage of women in the group of multiparous adolescents had weight gain ≥10kg compared to the group of primiparous adolescents (44.9% and 55.0%) and a significantly higher percentage of multiparous adolescents had gestational interval <24 months compared to the group of adults (72.4% and 23.7%).

A significantly higher percentage of multiparous adolescents had no prenatal care compared to the group of primiparous adolescents

Table 1. Maternal demographic and antenatal variables according to group (%).

Characteristics	Adolescents		Adults	*p*1	*p*2
	Multiparous	Primiparous			
One or more abortions	7.0	4.1	16.1	ns	<0.05
No partner	24.6	39.5	14.9	<0.05	<0.05
≥9 years of schooling	4.4	10.0	14.9	<0.05	<0.05
≥5 prenatal visits	57.7	74.7	76.1	<0.0005	<0.005
No living children	6.0	-	4.3	-	ns
One or more children dead	7.0	-	5.8	-	ns
One or more previous C-sections	22.3	-	25.3	-	ns
Weight increase ≥10kg	44.9	55.0	51.3	<0.05	ns
Gestational interval <24 months	72.4	-	23.7	-	<0.05
Total	189.0	398.0	398.0		

p1= multiparous adolescents *versus* primiparous adolescents; p2= multiparous adolescents *versus* multiparous adults; ns= non significant.

Table 2. Number of prenatal visits according to group.

Prenatal visits	Adolescents		Multiparous adults
	Multiparous	Primiparous	
No prenatal care	6.3	2.3	3.9
1 – 4 consultations	36.0	22.9	20.1
•5 consultations	57.7	74.7	76.1
Total	189.0	388.0	389.0

Multiparous adolescents *versus* primiparous adolescents: $p<0.0005$; multiparous adolescents *versus* multiparous adults: $p<0.00005$.

or adults (6.3%, 2.3% and 3.9%, respectively) (Table 2).

Obstetric and neonatal outcomes were similar in all the groups except for the number of small-for-gestational-age infants among multiparous adolescents, which was twice the rate found in multiparous adults (7.3% and 3.6%) (Table 3). Multiple logistic regression (model 1, including only adolescents) showed that parity (1 and ≥2) was not a risk factor for gestational hypertension, cesarean section, premature birth, low birth neonatal weight or SGA infants. Table 4 shows the multiple logistic regression analysis (model 2, only multiparous adolescents and adults) for SGA. Maternal age ≤19 years was an isolated factor that doubled the risk for SGA infants independently of any other factor (OR=2.119). Prenatal care as a continuous variable was a protective factor for SGA infants in this group of women; in other words, the higher the number of prenatal consultations, the lower the risk for SGA infants among multiparous women (OR= 0.311).

DISCUSSION

Repeat teenage pregnancy has been increasing as a public health problem in many countries, including Brazil. A recently published study review pointed out that the most important risk factors for repeat pregnancy during adolescence include low maternal age, low level of parents' education, lack of family support, dropping out of school and history of previous spontaneous abortion[6]. These factors demonstrate that repeat adolescent pregnancy is more likely to occur in an unfavorable emotional and psychosocial environment.

In our study, the percentage of women without a partner was higher in the group of multiparous adolescents (24.6%) than in the group of adults with the same parity (14.9%), and multiparous adolescents had a lower educational level than the women in the other groups. In this group, the experience from previous pregnancies and deliveries did not seem to have provided conjugal stability. On the other hand, the repeat pregnancies occurring in the group of

Table 3. Obstetric and neonatal outcomes according to group.

Obstetric/Neonatal Outcomes	Adolescents		Multiparous adults	*p*1	*p*2
	Multiparous	Primiparous			
Gestational hypertension	2.8	4.7	3.1	ns	ns
Cesarean section	8.5	9.0	9.8	ns	ns
Puerperal infection	-	0.6	-	ns	ns
Puerperal hemorrhage	0.6	0.9	0.6	ns	ns
Gestational age <37 weeks	6.3	9.7	4.6	ns	ns
Low birth weight (weight <2.500grams)	11.6	15.8	8.8	ns	ns
Small-for-gestational-age (SGA)	7.3	7.8	3.6	ns	<0.05
Neonatal death	-	1.9	0.4	ns	ns
Total	189.0	398.0	398.0		

*p*1= multiparous adolescents *versus* primiparous adolescents; *p*2= multiparous adolescents *versus* multiparous adults; ns= non significant.

Table 4. Multiple logistic regression model for SGA including only multiparous women (adolescents and adults).

Variable	Standard error	Wald Chi-Square	*p* Chi-Square	*Odds Ratio*
Intercept	0.2722	145.8944	0.0001	
Maternal age	0.3888	3.7286	0.0535	2.119
Intercept	0.2793	72.9081	0.0001	
Prenatal care	0.4142	7.9527	0.0048	0.311

multiparous adolescents resulted in a great impact on the number of years that teenagers in this group attended school. According to Kalmuss and Namerow (1994), those adolescents with more educated parents are less likely than others to have had a closely spaced second birth. In addition, young mothers who obtain additional schooling during the period following their first delivery are less likely to have a closely spaced second birth, whereas those who marry are more likely to have a rapid second birth.

It is also important to highlight that in our group of multiparous adolescents, 7% had a history of at least one abortion, 6% had no living children, and 7% had at least one deceased child. These figures are an indication of gestational wastage (20%) at the beginning of reproductive life, which could have disastrous physical, emotional and social consequences.

With respect to obstetric outcome, we observed that the percentage of obstetric and neonatal complications was statistically similar among the groups, except for SGA infants, the rate of which was found to be almost twice as high in multiparous adolescents (7.3%) as in multiparous adults (3.6%). Logistic regression analysis applied to this variable showed that increasing the number of prenatal consultations would protect against SGA infants; on the other hand, young women have a higher risk of this neonatal complication.

The group of multiparous adolescents in our study had the worst performance in prenatal care (number of prenatal consultations carried out during pregnancy). When compared to the two other groups, this group presented more women who had no prenatal care whatsoever and fewer women who had attended five or more prenatal consultations. Prenatal care has also been investigated by other authors and some of them have reported similar findings. A community-based survey including 1 247 adolescents, 12-19 years of age, in rural Kenya showed no difference in antenatal care attendance, place of delivery or pregnancy outcome for first-time and repeat pregnancies. Nevertheless, a lower proportion of younger primigravidae sought medical attention for health problems that arose during pregnancy[15]. Another study reviewed the medical records of 686 women, 17 years old or less, and found that 35% of the patients had received no prenatal care or had initiated care in the last trimester of their first pregnancy, compared to 49% who received late prenatal care or none at all during their second pregnancy (a highly significant difference)[9]. Covington et al.[16] examined factors associated with the number of prenatal care visits during second pregnancies in adolescents who had a short interval between pregnancies, and concluded that the number of prenatal care visits during the first pregnancy, poor first birth outcome, interval between first and second pregnancy, and care provided by health department staff during first pregnancy were all positively associated with the number of prenatal consultations during the second pregnancy when this data was controlled for gestational age of second birth (the authors assumed that as the number of prenatal care visits is somewhat constrained by the pregnancy duration, gestational length of the second pregnancy must be controlled)[16]. These data suggest that offering high quality prenatal care with experienced and supportive staff is an important recommendation for improving the obstetric and perinatal performance of these young women.

Young maternal age as a risk factor for repeat pregnancy outcome has also been investigated by other authors. Santelli & Jacobson[7] reviewed birth register data from 154 mothers under 20 years of age who had their first and second baby prior to or at 20 years of age (Group 1); 174 mothers under 20 years of age at the first birth, whose second birth was delayed until they reached 20 to 25 years of age (Group 2), and 81 mothers who were 20-25 years of age at both births (Group 3). Results showed that group 1 mothers had high but identical rates of low birth weigh at both deliveries and high rates of very low birth weight infants. Group 2 mothers were older at first birth and had better outcomes for first and second births than Group 1 mothers. In Group 1 mothers, prenatal care was initiated later during the second pregnancy than during the first pregnancy. In contrast, Groups 2 and 3 showed an improvement in

accessing prenatal care for the second pregnancy. A cross-sectional analysis of the US Natality Files, 1990 to 1996 also demonstrated that the risk of very preterm births in multiparous teenagers was associated with young age after controlling for other risk factors such as smoking and interpregnancy interval[12]. A cohort study including nearly 900 adolescents and adults showed that, among multiparas, there were several statistical interactions associated with increased risk of small-for-gestational-age infants, including interactions between young age and low pre-pregnancy body mass, young age and a previous low-birth-weight infant, and young age and a previous preterm delivery[17]. Finally, in a meta-analysis study, Stevens-Simon et al.[18] concluded that when the information is analyzed cross-sectionally, a statistically significant, negative linear relationship emerges between mean birth weight and parity in women of less than 20 years of age.

In conclusion, although the multiparous adolescents had poor social conditions (low educational level, poor prenatal care, and low weight increase during pregnancy), the obstetric outcome of multiparous and primiparous adolescents was very similar. The social conditions of multiparous adolescents were worse than those of multiparous adults (lower schooling, a larger number of women without a partner, poor prenatal care, low weight increase, and smaller gestational interval) and they had a higher percentage of SGA newborns than the adults.

Many studies on obstetric and perinatal outcome in adolescent repeat pregnancy have reported methodological limitations, emphasizing the need to control sociodemographic variables in order to avoid them as confounding variables[7,19]. This study found that marital status, number of years attending school, prenatal care, weight gain during pregnancy, and interpregnancy interval were unfavorable among multiparous adolescents. However, low maternal age and poor prenatal care were the only variables associated with risk for SGA infants. Nevertheless, it is possible that other factors not included in this study may have influenced the results, and further studies focusing on repeat teenage pregnancy should be carried out in Brazil.

Repeat pregnancy during adolescence is a serious public health problem that causes a deep social impact on the adolescent as well as on the child. For the mother, educational and job opportunities are frequently impacted; on the other hand, low maternal socioeconomic status can cause a negative impact on perinatal results. Therefore, preventing repeat and unplanned pregnancies in adolescence should be a high priority for political and health authorities in Brazil.

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