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Obstetrical and Perinatal Outcomes of Adolescent Pregnancies in Cameroon: A Retrospective Cohort Study at the Yaoundé General Hospital

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Abstract

Background: Adolescent pregnancy is a serious health and social problem worldwide as well as in Cameroon. The aim of this study was to determine the obstetrical and perinatal outcomes of nulliparous adolescent pregnancies in a reference hospital in Cameroon. Methods: A retrospective cohort study to compare the outcomes of nulliparous adolescent pregnancies to those of nulliparous women aged 20 to 25 years was carried out at the Yaoundé General Hospital between January 1993 and December 2012. Results: Adolescent deliveries represented 2.84% (331 deliveries) of all deliveries registered during the study period. The adolescent mothers had a significantly higher incidence of preeclampsia/eclampsia, preterm delivery and low birth weight babies (<2500 g) when compared to the control group (OR, 3.46; CI 95%, 1.46 - 8.18; OR, 1.94 CI 95%, 1.34 - 2.79; OR, 1.98, CI 95%, 1.39 - 2.46, respectively). However, placenta previa, abruptio placenta, episiotomy, cesarean section, vaginal instrumental delivery, perineal tears and post partum hemorrhage were not significantly different in the two groups. Furthermore, there was no statistically significant difference between the two groups regarding fetal distress, low Apgar score (<7 at the 1st and 5th minutes), the rate of admission in the neonatal intensive care unit, stillbirth and neonatal death. Conclusion: Adolescent pregnancy is associated with an increased risk of preeclampsia/eclampsia, preterm birth and low birth weight.

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Keywords

Adolescent Pregnancy, Perinatal and Obstetrical Outcome, Preterm Birth, Low Birth Weight

1. Introduction

Adolescent pregnancy is defined by the World Health Organization as a pregnancy occurring in girls aged 10 - 19 years [1]. It is a serious health and social problem worldwide [2]-[6]. In 2008, there were estimated 16 million births to mothers aged 15 - 19 years worldwide. About 95% of these births occurred in low- and middle-income countries [7] [8].

In Cameroon, a recent study carried out to assess adolescents' contribution to deliveries in referral maternities reported that adolescents overall contributed to 14.23% of deliveries [9]. The factors leading to adolescent pregnancy included early marriage and low access to modern contraception [8] [10] [11].

The social consequences of adolescent pregnancy include school dropout and in some settings, violence, including suicide and homicide [8].

Most studies from developed and developing countries have reported among pregnant adolescents higher risks of inadequate prenatal care [12] [13], low birth weight and premature birth [14]-[16]. However, other adverse pregnancy outcomes such as, preeclampsia, cesarean section, vaginal instrumental delivery, and postpartum hemorrhage are controversial in literature [17]. These consequences of adolescent pregnancies vary from one context to another [8].

The aim of this study was to determine the obstetrical and perinatal outcomes of nulliparous adolescent pregnancies at the Yaoundé General Hospital (YGH).

2. Methods

This was a retrospective cohort study carried out at the Yaoundé General Hospital (YGH), a tertiary teaching hospital in Yaoundé, which is an urban setting in Cameroon, Central Africa. At the YGH, normal deliveries are carried out by residents and midwives under the supervision of obstetricians. Furthermore, vaginal instrumental deliveries and cesarean deliveries are done by obstetricians assisted by residents. Birth records are filled by the midwives.

All nulliparous women aged 19 years or less who put to birth in this hospital between January 1993 and December 2012 were consecutively recruited in this study as the study group. Alongside, the nulliparous women aged 20 - 25 years were grouped as the control group. Excluded from the study were all the women whose pregnancies failed to reach 28 weeks and those who had a previous pregnancy that reached 28 weeks and beyond. The sample size was calculated using the Epi Info software at a power of 80% and a 95% level of confidence. From previous studies, the mean prevalence of adverse maternal outcome was estimated at 24.9% [16]. Thus, the minimum sample size was estimated at 448 (224 women in the study group and 224 controls).

Data used in the analysis was obtained from available hospital records (delivery registers, medical files). The data included the socio-demographic, obstetrical and perinatal characteristics of the two groups. Gestational age was estimated from the first date of the last menstrual period, since the ultrasound dating of pregnancy was not usually done in our setting. The maternal variables studied were HIV status, preeclampsia/eclampsia, antenatal hemorrhage (placenta previa, abruptio placenta), cesarean delivery, instrumental vaginal delivery, perineal tear, episiotomy and post-partum hemorrhage (defined as an estimated blood loss >500 mL following a vaginal birth or >1000 mL following a cesarean section).

The perinatal outcomes studied were prematurity (live birth before 37 weeks of gestation), low birth weight (<2500 g), very low birth weight (<1500 g), low Apgar score (<7 at the 5^{th} minute), admission to the neonatal intensive care unit, intra uterine fetal death, fetal distress (defined as persistent or recurrent abnormal fetal heart rate) and early neonatal mortality (death during the first week of life).

The data collected was analyzed using the 2009 SPSS version 18.0.0 (2000 SPSS Inc., IL, USA).

Categorical variables were compared by Chi-square test. The level of significance was defined as $p < 0.05$ or by a 95% confidence interval that did not include 1.

3. Results

During the study period, there were 11,640 deliveries at the Yaoundé General Hospital. Of these, 331 (2.84%) deliveries were from adolescents aged 19 years and less and 11,309 (97.15%) were from women aged 20 years and above. Of the deliveries from adolescent mothers, 285 (86.10%) were primiparous and 40 (13.89%) were multiparous.

Table 1 presents the characteristics of both the study group (nulliparous adolescent mothers) and the control group (nulliparous mothers aged 20 to 25 years). The mean gestational age at birth was significantly lower among nulliparous adolescent mothers when compared to women aged 20 to 25 years. However, the incidences of HIV infection, multiple pregnancies, and abnormal presentation were not significantly different in these two groups.

Table 2 shows the obstetrical complications of adolescent mothers and those of women aged 20 - 25 years.

Table 1. Characteristics of the study group and the control group.

Variables	Maternal age		
	<20 years	20 - 25 years	
	% (n = 285)	% (n = 1394)	p
Maternal age (Mean ± SD)	17.76 y ± 1.30	22.86 y ± 1.64	-
Gestational age at birth (Mean ± SD)	38.19 w ± 3.05	38.62 w ± 2.37	**0.040**
Marital status			
Married	23.50 (67)	66.42 (926)	**0.000**
Single	76.49 (218)	33.57 (468)	
No. of antenatal visits ≥ 4	71.92 (205)	72.38 (1009)	**0.862**
HIV infection	0.70 (2)	0.8 (11)	0.878
Multiple pregnancies	3.16 (9)	2.8 (39)	0.740
Abnormal presentation	4.21 (12)	3.51 (49)	0.580
Cephalic presentation	93.68 (267)	93.47 (1303)	-

y: years; w: weeks.

Table 2. Obstetrical complications of adolescent mothers and mothers aged 20 - 25 years.

Variables	Maternal age			
	<20 years	20 - 25 years		
	% (n = 285)	% (n = 1394)	Odds ratio [CI 95%]	p
Preeclampsia/eclampsia	3.15 (9)	0.93 (13)	**3.46 [1.46 - 8.18]**	0.006
Placenta previa	0.35 (1)	0.14 (2)	2.45 [0.04 - 47.18]	0.428
Abruptio placenta	0.35 (1)	0.14 (2)	2.45 [0.04 - 47.18]	0.428
Cesarean sections	13.68 (39)	12.98 (181)	1.07 [0.73 - 1.55]	0.717
Induction of labor	7.71 (22)	15.06 (210)	**0.47 [0.29 - 0.77]**	0.001
Vaginal instrumental delivery	2.45 (7)	2.94 (41)	0.77 [0.31 - 1.82]	0.53
Perineal tear	20.35 (58)	22.38 (312)	0,82 [0.61 - 1.23]	0.41
Episiotomy	19.29 (55)	18.00 (251)	1.07 [0.74 - 1.53]	0.715
Post partum hemorrhage	0.35 (1)	0.64 (9)	0.54 [0.01 - 3.93]	1.000

The adolescent mothers had a significantly higher incidence of preeclampsia/eclampsia when compared to women aged 20 to 25 years (OR, 3.46; CI 95%, 1.46 - 8.18). However, placenta previa, abruptio placenta, episiotomy, cesarean section, vaginal instrumental delivery, perineal tears and post partum hemorrhage were not significantly different in the two groups. On the other hand, induction of labor was significantly less frequent in the adolescent mothers (OR, 0.47 CI 95%, 0.29 - 0.77). There were no maternal deaths in both groups during the study's period.

Table 3 presents the perinatal outcome of pregnancies in adolescents and that of mothers aged 20 - 25 years. Compared to the control group, we found that the incidence of preterm delivery was significantly higher among adolescent mothers (OR, 1.94 CI 95%, 1.34 - 2.79). The mean birth weight was lower among adolescent mothers ($p = 0.04$) and the incidence of low birth weight babies (<2500 g) was significantly higher among adolescent mothers (OR, 1.98, CI 95%, 1.39 - 2.46). However, there was no statistically significant difference between the two groups regarding fetal distress, low Apgar score (<7 at the 1st and 5th minutes), the rate of admission to the neonatal intensive care unit, stillbirth and neonatal death.

4. Discussion

Pregnancy at an early age is regrettably common in many low-income countries, and yet the debate about the degree of risk associated with it is still open. Overall, in this large retrospective cohort study carried out at a tertiary hospital in Cameroon, we found that the adolescent mothers had a higher risk of preeclampsia/eclampsia, preterm birth and low birth weight when compared to mothers aged 20 - 25 years.

Several studies have highlighted the importance of antenatal care in reducing the risks of adverse outcome during pregnancy [4] [18]-[20].

The lesser adverse maternal and neonatal outcomes found among adolescents in this study may be due mainly to adequate prenatal care. The majority of pregnant adolescents (71.92%) and women aged 20 - 25 years (72.38%) made at least four prenatal visits. Furthermore, the Yaoundé General Hospital is a reference hospital where antenatal services, delivery and postpartum care are provided by obstetricians, residents and midwives.

As seen with previous studies [4] [6] [12] [16], this study shows the increased risk of preterm deliveries in adolescent pregnancies. The mechanisms associated with preterm labor among adolescent mothers are still unclear. However, one physiological reason that could have an influence is the immaturity of the uterine or cervical blood supply in young mothers. This condition stimulates prostaglandin production that leads to preterm deli very [17].

Table 3. Perinatal characteristics and complications of adolescents and mothers aged 20 - 25 years.

Variables	Maternal age			
	<20 years	20 - 25 years		
	% (n = 285)	% (n = 1394)	Odds ratio (CI 95%)	p
Preterm birth (<37 weeks)	17.89 (51)	10.25 (143)	**1.94 [1.34 - 2.79]**	0.000
Prolonged pregnancy (>41 weeks)	3.15 (09)	2.72 (38)	1.18 **[0.56 - 2.46]**	0.659
Birth weight (Mean ± SD)	2967.82 g ± 622	3086 g ± 542	--	0.04
Low birth weight < 2500 g	17.89 (51)	9.89 (138)	**1.98 [1.39 - 2.81]**	0.001
Very low birth weight < 1500 g	2.10 (6)	1.50 (21)	1.46 [0.52 - 3.85]	0.419
Fetal distress	2.10 (6)	2.36 (33)	0.89 [0.33 - 2.24]	0.789
Low Apgar score (<7 at 1st min)	12.28 (35)	13.62 (190)	0.88 [0.59 - 1.32]	0.530
Low Apgar score (<7 at 5th min)	1.05 (03)	2.00 (28)	0.57 [0.13 - 2.03]	0.450
Admission to NICU*	16.14 (46)	16.42 (229)	0.98 [0.68 - 1.40]	0.899
Intrauterine fetal death	1.05 (3)	0.71 (10)	1.47 [0.26 - 5.76]	0.472
Neonatal death	0.70 (2)	0.14 (2)	4.92 [0.49 - 48.88]	0.136

g: grams; *NICU: neonatal intensive care unit.

Psychological instability of young mothers, which has been reported to increase the risk of preterm labor, may be an additional factor [21]. The high incidence of unmarried adolescent mothers in this study could be a factor of psychological instability and could explain the increased rate of preterm birth.

The etiology of preterm birth is multifactorial and includes socioeconomic conditions, maternal malnutrition, iron deficiency anemia, vaginal and urinary tract infections, young maternal age at first delivery and hypertensive disorders during pregnancy [14] [22]. We did not evaluate the incidence of genito-urinary tract infections. The high incidence of preeclampsia/eclampsia among adolescent mothers in this study is another contributing factor to preterm birth.

The exact causes of preeclampsia are not known. Preeclampsia is most often seen in first-time pregnancies, in pregnant teens, and in women over 40. The high incidence of pre-eclampsia/eclampsia among pregnant adolescents ties with the findings of other studies [16] [23]. However, some authors reported no significant association between adolescent pregnancy and preeclampsia/eclampsia [24]. Face the variation in the literature on the incidence of preeclampsia among adolescents compared to adults over 20 years, it would be advisable to conduct a large multicenter study to elucidate this question.

We found that the rate of induction of labour was significantly lower in adolescent mothers compared to mothers aged 20 - 25 years. The possible explanations could be a more functional myometrium, greater connective tissue elasticity, a lower cervical compliance and low birth weight babies in adolescents that allowed for more spontaneous vaginal deliveries [25].

Our finding with respect to cesarean section rate is contrary to the widely held belief that biological immaturity of the adolescent pelvis causes cephalopelvic disproportion leading to increased cesarean section rate [26] [27].

Similar to our findings, other studies did not find any increase in the cesarean section rates among adolescents [12] [16] [17]. This controversy can be explained by the fact that adolescents generally give birth to small size babies such that cephalopelvic disproportion may not be a major problem in this age group.

As seen in literature [16] [28], this study demonstrated that adolescent mothers were at a higher risk of delivering low birth weight infants that weighed <2500 g. This higher rate of low birth weight infants among adolescent mothers was possibly due to the higher incidence of preterm birth among adolescent mothers in this study.

This study has some limitations. This was a retrospective study with the risk of bias. YGH is a reference hospital located in an urban area. This limits its accessibility to women with low socioeconomic level thus providing a selection bias.

5. Conclusion

The results of this study suggest that adolescent pregnancy is associated with an increased risk of preeclampsia/eclampsia, preterm birth and low birth weight. However, cesarean delivery, instrumental vaginal delivery, stillbirth and early neonatal mortality were not significantly different between adolescents and adult mothers. Adolescents need to be educated about the harmful effects of pregnancy at a young age. Teaching them about contraception and safe sex should reduce the rate of adolescent pregnancy and sexually transmitted infections.

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