Critical analysis of multiparity in adolescent pregnancy

Análise crítica da multiparidade na gravidez adolescente

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ABSTRACT
To demonstrate the obstetric profile of teenage pregnancy and maternity parity in the metropolitan region of Curitiba, in southern Brazil, from 2009 to 2014, in order to provide information for interventions in preventing non-planned pregnancy in this population. Data regarding maternal age, gestational age, newborn weight, obstetric complications and type of delivery were collected in 4668 patients aged between 15 and 19 years, and those aged 20 to 24, with previous teenage pregnancy. An Excel table was created to store the information, later analysed. Most patients were primigravid (71%), with 22% in the second pregnancy. Multiparity was present in 29% of pregnant women. The mean age at first pregnancy was 17.3 years (standard deviation of 1.30). The main route of delivery was vaginal, in 80%. Episiotomy was performed in 70% of these deliveries. Cesarean deliveries occurred mainly due to induction failure (19.8%), cephalopelvic disproportion (14.4%) and fetal distress (11.1%). Mean gestational age was 39.1 weeks (standard deviation 1.5). Low birth weight occurred in 7% of newborns, and 4% were preterm. Most of the patients analysed were primiparous aged 17.3 years. Multiparity in adolescence proved to be a frequent phenomenon in the region studied, with a prevalence of 30%, occurring at an average age of 18.6 years old. A quarter of 20-year-old patients’ population had more than two pregnancies. The presence of episiotomy was high, performed in 70% of vaginal deliveries, a value above the recommended by WHO.

Keywords: adolescent pregnancy, recurrence, multiparity, Brazil.

RESUMO
Demonstrar o perfil obstétrico da gravidez na adolescência e a paridade destas gestantes, na região metropolitana de Curitiba, no sul do Brasil, de 2009 a 2014, a fim de fornecer subsídios para intervenções na prevenção da gestação não-planejada nesta população. Os dados referentes à idade materna, idade gestacional, peso do recém-nascido, complicações obstétricas e tipo de parto foram coletados dos prontuários de 4.668 pacientes com idade entre 15 e 19 anos e entre 20 e 24 anos, com gravidez anterior na
adolescência. Uma tabela Excel foi criada para armazenar as informações, posteriormente analisadas. A maioria das pacientes era primigesta (71%), com 22% na segunda gestação. A multiparidade esteve presente em 29% das gestantes. A idade média da primeira gravidez foi de 17,3 anos (desvio padrão de 1,30). A principal via de parto foi vaginal, em 80%. A episiotomia foi realizada em 70% desses partos. Os partos cesáreos ocorreram principalmente por falha de indução (19,8%), desproporção cefalopélvica (14,4%) e sofrimento fetal (11,1%). A idade gestacional média foi de 39,1 semanas (desvio padrão 1,5). O baixo peso ao nascer ocorreu em 7% dos recém-nascidos e 4% eram prematuros. A maioria das pacientes analisadas eram primíparas com idade média de 17,3 anos. A multiparidade na adolescência mostrou-se um fenômeno frequente na região estudada, com prevalência de 30%, ocorrendo em média de 18,6 anos. Um quarto da população de pacientes de 20 anos teve mais de duas gestações. A presença de episiotomia foi elevada, realizada em 70% dos partos vaginais, valor acima do recomendado pela OMS.

Palavras-chave: gestação na adolescência, recorrência, multiparidade, Brasil.

1 INTRODUCTION

In the health’s macro-region of Curitiba and metropolitan region, in the years 2009-2019, there were 82,413 live births in teenage mothers, totalling 15.1% of total deliveries. The 15 to 19 age group represented 14.5% of all live births. In the city of Colombo, where the Alto Maracanã Maternity Hospital is located, in the decade studied, there were 7,539 births of pregnant women aged 15 to 19 years-old (18.4%) with a progressive decrease. In 2009, the total number was 831 and in 2019, 457. (1) These data indicate live births to mothers aged 15-19 years, without the correlation of parity, nor of abortions.

In Brazil, teenage pregnancy remains prevalent, with a rate of 68.4/1000 (in time, world rate is 46/1000). (2) During the years 2006-2010, there was a 12.7% reduction in live births of teenage mothers. There was a slight increase (1.8%) between 2010-2014, with a decrease of 2.7% in 2015. The reduction considering the period 2006-2015 was 13.5% (value 21.5% in 2006 and 18.1% in 2015). Considering only the early adolescence range (10-14 years), the North region showed an increase of 5%, with a decrease in the rest of the country. Decrease in the 15-19 age group prevailed across the country, 14% in the southern region. (2)

Adolescent pregnancy entails several consequences for the maternal-fetal pair, including school dropout, pre-eclampsia, prematurity, and low birth weight. (3) Recurrence of pregnancy, especially within the next 24 months, increases the morbidity and mortality of early pregnancy, tripling the risk of prematurity and stillbirths. (4) The recurrence rate ranges from 30-70%. The factors with the greatest associations for subsequent
pregnancies are low socioeconomic status, family history of adolescent pregnancy, social pressure, domestic violence, lack of effective contraception, history of abortion and low education.\(^{3,5,6}\)

Protective factors against rapid recurrence of pregnancy (RRP) include increased education and contraception, preferably long-term use, such as subdermal implants and intrauterine devices.\(^{7}\) The impact is more positive if the offer and prescription occur in the immediate postpartum period, in which parturients are more likely to accept these methods.\(^{4}\) In Brazil, the use of these devices is not widespread, either due to unavailability in the Public Health System, or because of rejection and lack of knowledge by patients, in addition to the low prescription by physicians.\(^{6,8}\)

The study proposes to demonstrate the profile of multiparity in adolescence based on information collected regarding the age of pregnant women, parity, mode of delivery and obstetric complications. With these data, the aim is to create a basis for future interventions in the region, guiding public health programs.

2 MATERIAL AND METHODS

The research was designed as a retrospective cross-sectional study with data from the Live Births Document of mothers aged 15 to 19 years old, and 20 to 24 years old with previous pregnancy in adolescence, who delivered at Alto Maracanã Maternity Hospital, in Colombo, metropolitan region of Curitiba. The information gathered contained maternal age, parity, mode of delivery, gestational age, newborn weight, indication for cesarean section, use of misoprostol, oxytocin, episiotomy, presence of laceration and use of forceps.

The original study aimed to analyse years of 2009 to 2019, however years beyond 2014 were not included in this research due to unavailability of records. The main source of data was in book format, in handwritten form, therefore some patients were excluded from the study due to difficulty of complete data. Patients aged 20 to 24 years with incompatible parity with previous complete pregnancy in adolescence were also excluded due to the absence of medical records proving the past history. Thus, 20-year-old patients were included with parity two, 21 with parity 3, 22 with parity 4, 23 with parity 5 and 24 with parity 6, as long as there was no abortion as it did not represent a complete pregnancy. The other exclusion criteria were patients with parity greater than 1 to 15 years-old women and miscarriages as a current complication.
The analysis of data collected in an Excel® table was with the computer program IBM SPSS Statistics v.20.0. Armonk, NY: IBM Corp. Quantitative variables were described by mean, standard deviation, median, minimum and maximum, and categorical variables were described by frequency and percentage.

3 RESULTS

The survey included 4668 patients from 2009 to 2014, with 2009 being the main contributor, representing 20.8% of the total (970) and 2014 having the lowest number (656) – figure 1. The main mode of delivery was vaginal, representing 80% (3731). The most frequent obstetric complication was episiotomy, a procedure performed in 70.4% of the patients, followed by the use of oxytocin in 45.2%, laceration in 8.7% and the use of forceps in 6.6%. Regarding the newborn's weight, in 90% of episiotomies, the weight was between 2500 and 4000g, 92.8% of lacerations were in this same weight range, as well as the use of forceps.

![Figure 1: Teenage pregnancy deliveries per year](source: the Authors)

Cesarean sections were performed in 935 patients, the main indication being induction failure (19.8%), followed by cephalopelvic disproportion (14.4%), fetal distress (11.1%) and breech presentation (9.4%), as showed in table 1. In the disproportion, 82.8% of newborns weighed between 2500 and 4000g, and 12.1% above. These indications are not exclusive, and there may be more than one reason for the surgery. The age groups with more cesarean sections were 18 and 19 years old (21.2% and 21.1%).
Table 1: Indication of caesarean section

<table>
<thead>
<tr>
<th>Indication</th>
<th>Total and percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induction failure</td>
<td>185</td>
</tr>
<tr>
<td>Cephalopelvic disproportion</td>
<td>135</td>
</tr>
<tr>
<td>Fetal distress</td>
<td>104</td>
</tr>
<tr>
<td>Breech presentation</td>
<td>88</td>
</tr>
<tr>
<td>Meconium</td>
<td>71</td>
</tr>
<tr>
<td>Elective surgery</td>
<td>60</td>
</tr>
<tr>
<td>Progression distortion</td>
<td>54</td>
</tr>
<tr>
<td>Pregnancy-specific hypertensive disease</td>
<td>40</td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>32</td>
</tr>
<tr>
<td>Previous cesarean (iterative)</td>
<td>26</td>
</tr>
<tr>
<td>Cervical distortion</td>
<td>22</td>
</tr>
<tr>
<td>Post maturity</td>
<td>17</td>
</tr>
<tr>
<td>Abruptio placenta</td>
<td>12</td>
</tr>
<tr>
<td>Mal rotation</td>
<td>7</td>
</tr>
<tr>
<td>Macrosomia</td>
<td>7</td>
</tr>
<tr>
<td>Twin pregnancy</td>
<td>6</td>
</tr>
<tr>
<td>Eclampsia</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: the Authors

The average age of the first pregnancy was 17.3 years (standard deviation 1.30), 18.6 years in the second pregnancy (standard deviation 1.25), 19.6 in the third pregnancy (standard deviation 1.13), fourth pregnancy 20.3 (standard deviation 1.30). Most births were in primigravidae (3,311), followed by second-pregnant women (1,057). Only 58 patients had parity equal to or greater than 4. Of the current births analysed, the prevalence was higher in patients aged 18 and 19 years, totalling 47% together, as seen in table 2.

Table 2: Maternal parity by age

<table>
<thead>
<tr>
<th>Parity</th>
<th>Age (years-old)</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>≥ 22</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>365</td>
<td>592</td>
<td>746</td>
<td>846</td>
<td>764</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>98.6%</td>
<td>87.3%</td>
<td>83.5%</td>
<td>77.3%</td>
<td>67.0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>5</td>
<td>84</td>
<td>134</td>
<td>224</td>
<td>313</td>
<td>299</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.4%</td>
<td>12.4%</td>
<td>15.0%</td>
<td>20.5%</td>
<td>27.4%</td>
<td>72.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>2</td>
<td>12</td>
<td>23</td>
<td>54</td>
<td>99</td>
<td>52</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.3%</td>
<td>1.3%</td>
<td>2.1%</td>
<td>4.7%</td>
<td>23.9%</td>
<td>81.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>1</td>
<td>2</td>
<td>10</td>
<td>12</td>
<td>9</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.1%</td>
<td>0.2%</td>
<td>0.9%</td>
<td>2.9%</td>
<td>14.1%</td>
<td>70.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>4</td>
<td>2</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>1.0%</td>
<td>3.1%</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.6%</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>5.9%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>370</td>
<td>678</td>
<td>893</td>
<td>1095</td>
<td>1141</td>
<td>414</td>
<td>64</td>
<td>17</td>
</tr>
</tbody>
</table>

Source: the Authors
Considering the total parity (previous and current), 77.6% had no caesarean, and having one represented 19.9%. Regarding age, there were no major differences between those 15 to 19 years-old in the first surgery. Looking to those with a second caesarean, most of them were 20 years old (7.7%), in the third cesarean, patients aged 21 prevailed (9.4%). Having only one vaginal delivery added up to 60.7%, with 15-year-old patients representing the highest value (79.7%). The highest number of vaginal deliveries in the study was 6, in a patient from the age group ≥22. Miscarriages were present in 5.37% of patients, especially in patients aged 20 years-old or over.

The mean duration of pregnancies was 39.1 weeks, with a standard deviation of 1.5. Only 106 newborns (4%) were premature. Only 56.7% of the analysed deliveries provide information about gestational age and weight. The weight of newborns was within the values of 2500 to 4000g in most cases (89.9%), with 7% below and 3% above.

4 DISCUSSION

The city of Colombo recorded 4673 live births in the years 2009-2014 related to mothers aged 15-19 years-old, comprising 20% of the deliveries. This study included 4172 of those patients.

The profile of the adolescent patients assisted in this study was characterized by age, parity and mode of delivery. Vaginal labour was most prevalent, in 80% of patients. Mean age at first pregnancy was 17.3 years, second pregnancy 18.6 years, third 19.6 years and higher parity 20.3 years. Most patients included in the survey were primigravid. The mean age in the Brazilian literature ranged from 16.1 to 17.9 years, in line with the present study. Younger ages were found in the study by Brito et al in Bahia, Brazil (15.4 years). The preferred mode of delivery was vaginal, between 54.5% to 76%. Multiparity was present in 28.9% of patients in this study. Most with two pregnancies, followed by three. Recurrence of teenage pregnancy occurred in an average of 28.7 months in the study by Zanchi et al, half in the first two years, with 80% of participants recurring after 3 years. Recurrence rate found by Albuquerque et al was 42.6% in the first 24 months. In this study, not using contraceptive methods meant a 7-fold increase in the occurrence of a new pregnancy. The profile of patients with recurrence was especially those with up to 8 years of schooling, beginning of sexual life at the age of 14 years or less (52.2%) and without contraception. Okuda et al indicated a recurrence of 25.6%, similar to that found in Nery et al (25.9%), in which the risk for a
new pregnancy was derived from a lack of education, financial dependence and previous abortion (almost triple risk).\(^{(17,18)}\)

In the USA, Wilkie \textit{et al} showed rapid repetition of 16.6% in the first 256 days postpartum. The mean age was also different in this study, with primiparous women aged 18.3 years, age representing the second pregnancy in this study.\(^{(19)}\) Cohort of Lima Vieira \textit{et al} showed the lowest RRP value (3.7%), with an average of 20.9 months. Early adolescence (10-14 years) had the greatest risk, likewise to young women with inadequate education.\(^{(20)}\)

The profile of patients with rapid recurrence in the literature includes sexual initiation before the age of 15, drug addiction, lower educational level, previous history of pregnancy, school dropout, absence of contraceptive use.\(^{(6,9,12,14,18)}\)

The early onset of sexual life (\(\leq 15\) years-old) in the Brazilian literature was demonstrated by Brito \textit{et al} and Silva \textit{et al}, with respective ages of 13.8 and 13.9 years.\(^{(11,13)}\) In the study by Galvão \textit{et al}, 73.3% of patients with early sexual debut had RRP, and in Albuquerque \textit{et al}, 52.2.\(^{(6,12)}\)

School dropout was present in 43.3% of adolescents as showed by Brito \textit{et al}, 80% of patients with recurrence in Galvão \textit{et al} and about 60% in recurrent ones in Zanchi \textit{et al}.\(^{(6,13,14)}\) Incomplete schooling was present in 42% of the participants in the study by Fernandes \textit{et al}, 63.3% when seen in Santos \textit{et al}.\(^{(21,22)}\) In the south of the country, approximately 70% of adolescents had up to 8 years of schooling, however in the recurrent ones, this value decreases to 45%.\(^{(14)}\)

This study does not present data on education, so it is necessary to use data from DATATUS, which reveal that, in the period 2009-2014, 39.6% of adolescent mothers in Colombo had 4-7 years of education and 54.6% of 8-11 years.\(^{(1)}\)

Regarding obstetric characteristics, the mean gestational age in this study was 39.1 weeks, with only 10% of newborns weighing outside the normal curve of 2500-4000g, 7% weighing below. Prematurity was found in only 4% of newborns. Furthermore, the Maternity Hospital in this study provides assistance for pregnancies of usual risk, requiring transfer in cases of greater severity to the maternal-fetal binomial. According to DATASUS, in Colombo, the total number of premature births was 8% in the search period.\(^{(1)}\)

Low weight in the descendants of adolescent mothers was associated with lower educational level and bonding with a partner. In Santos \textit{et al}, weight below 2500 occurred
in 41.3%. Pregnant teenagers are at higher risk of prematurity, both in early adolescence (12-16 years) and late (up to 19 years) compared to adults.\(^{22,23}\)

Hypertensive disorder of pregnancy (HDP) was present in 4.3% and eclampsia as a separate entity, 0.6% in this study. The prevalence of HDP was lower compared to the literature. A systemic review by Macedo et al with data from 1969 to 2019 showed an overall rate of pre-eclampsia and eclampsia of 6.7% and eclampsia of 1.3%.\(^{24}\) In Porto Alegre, in the South region of Brazil, a value of 5.3% was found.\(^{25}\) Among these patients, 17.8% were classified as severe disease. Maternal negative outcomes were higher in the preeclampsia group compared to the control group (32.1% vs 7.9%). The main maternal complications were hemorrhage, uterine atony and HELLP syndrome. Furthermore, the risk of prematurity and low birth weight were also significantly higher.

Japanese data suggest a lower prevalence in the studied population, pre-eclampsia being present in 2.6% of late adolescents and eclampsia in 1.2%.\(^{26}\) A retrospective cohort of La-Orpipat et al evaluated HDP outcomes in primigravid women under 20 years of age in Thailand during the years 1996 to 2015. This group highlighted the increased risk of low birth weight, prematurity and reduced Apgar. Furthermore, the risk of HDP was more prevalent in early adolescence.\(^{27}\)

In this study, abortions were present in 5% of the patients, mainly in those aged 20 years or over. The presence of miscarriages contributes to rapid recurrence in pregnancy according to Maravilla et al, Nery et al and Wilkie et al (16% of miscarriages).\(^{7,18,19}\) In the latter, the risk for a new pregnancy included greater parity, greater number of abortions and less use of long-term contraception.

The routine performance of episiotomy is not supported by the literature. The WHO indicates use in up to 10% of deliveries, but a much higher value was found in this study: 70% deliveries.\(^{28}\) Regarding the indication for macrosomia, this was present in only 2.5%. A similar rate was found in Costa et al, with 66.67%.\(^{16}\) A Cochrane review indicated no benefit in the frequent conduct of episiotomy, demonstrating a greater risk of serious perineal injuries when routinely present.\(^{29}\) The average rate of standard use for this procedure was 83% and selective 32%. Possible indications are prematurity, anomalous presentations, macrosomia, shoulder distortion, prolonged second-stage labour, and non-reassuring fetal heartbeat.

Amorim et al had a selected episiotomy group and a group without episiotomy and showed no differences between the outcomes of the rate of the procedure (below 2%), laceration, duration of the second stage, postpartum pain, urinary incontinence, loss blood
and Apgar less than 7 in the fifth minute.\textsuperscript{(30)} EPITRAIL, a randomized study with 676 patients, from 2015 to 2018, was designed around two groups, with and without episiotomy. Indications for performing the procedure were fetal distress, instrumentalized delivery, prevention of imminent perineal injury, prevention of shoulder distortion in macrosomic fetuses. Episiotomy rates in the control group were 29.8\% and in the other, 19.6\%. This decrease did not affect the total number of severe perineal injury.\textsuperscript{(31)}

The prevention of the recurrence of pregnancy and pregnancy in adolescence occurs through schooling and the use of long-term contraceptives, these with the potential to reduce risk of up to 80\%.\textsuperscript{(7)} In a Brazilian study, adolescents had an original desire for contraception with intrauterine devices and depot medroxyprogesterone acetate (DMPA), one third each. Satisfaction classified as good occurred in more than 70\% of the two methods. Prior to pregnancy, one third of the patients used oral methods. The multiparity in this study was 10.85\%.\textsuperscript{(15)}

The presence of etonogestrel implant in the puerperium reduces the risk of a new pregnancy by up to 8 times.\textsuperscript{(4)} Maintenance of this method occurred in 97\% and 86\% of patients at 6 months and 12 months, respectively. The occurrence of irregular bleeding was the main discontinuation factor for the method.

The choice of pre-pregnancy contraceptives revealed a preference of hormonal pills (57\%), followed by the use of condoms (34\%).\textsuperscript{(15)} In patients with more than one pregnancy, the use of pills remained the same, but DMPA was used in 22\%. In the puerperal period, 2/3 of the participants opted for DMPA and just over 10\% for intrauterine devices. The population analysed in the Contraceptive CHOICE study in the United States showed different results from those in Brazil, with a predominance of long-term methods. Half of the 14-17 teens opted for etonogestrel implants and about ¼ intrauterine methods. The latter was chosen by 35\% of adolescents aged 18-19 years, followed by etonogestrel implantation and 15\% by hormonal pills.\textsuperscript{(32)} In the study by Wilkie \textit{et al}, 20\% of patients refused any contraceptive method in the puerperium. Among the chosen contraceptives, 27\% were DMPA and 24\% were intrauterine devices.\textsuperscript{(19)} Preference was also given to injectables in Brito \textit{et al} (40.4\%).\textsuperscript{(13)}

The importance of implementing projects to raise awareness among young people about contraceptive methods is raised by the questionnaire Sales Vieira \textit{et al}, in which 22.7\% of young males considered the use of condoms unnecessary in all sexual relations. In addition, 24.6\% of this segment and 17.1 of the female group consider the belief of protection against sexually transmitted infections by oral contraceptives as true. The main
methods known by the adolescents were the male condom, hormonal pills and female condoms, the latter with a significant difference for the female group. The limitation of this study is both in size (499) and in scope (a single college in a city in Minas Gerais, Southeast of Brazil).\(^{(33)}\)

Questionnaire applied by Brito et al in 2014-2015 with teenage mothers during prenatal consultations, in which 82% of pregnancies were unplanned, indicated lack of knowledge in 70% of patients about long-term contraception and 60% were unable to name more than four methods.\(^{(13)}\)

The high rates of patients without any peri-pregnancy method 51.7-63.5% and irregular use of methods ranging from 30 to 82% corroborate the need to encourage the use of contraceptives.\(^{(6,13)}\)

5 CONCLUSION

Teenage pregnancy is still prevalent in our country, with about 30% of teenagers aged 15 to 19 years having more than one pregnancy. As seen in this search, first pregnancy occurred at 17.3 years, second pregnancy at 18.6 years and third at 19.6 years. In those aged 20, a quarter presented with 3 pregnancies. The literature provided, and the multiparity on patients aged ≥18 years in this study demonstrate, the importance of encouraging education and the use of contraceptives, especially long-term in the immediate postpartum period. Prevention interventions should preferably occur in adolescents under the age of 17 years and should also include post-abortion patients.

COMPETING INTERESTS

The authors declare no competing interests.

CONTRIBUTIONS

Both the authors made substantial contributions to conception and design, data collection, analysis and interpretation of data. All of them wrote the draft manuscript, made its critical review of the intellectual content and finalized the article.
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