

## THE INFLUENCE OF MATERNAL AND OBSTETRIC CHARACTERISTICS ON THE NEONATAL PROFILE

### A INFLUÊNCIA DAS CARACTERÍSTICAS MATERNAS E OBSTÉTRICAS NO PERFIL NEONATAL

### LA INFLUENCIA DE LAS CARACTERÍSTICAS MATERNAS Y OBSTÉTRICAS EN EL PERFIL NEONATAL

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#### ABSTRACT

**Objective:** To describe the relationship between maternal and obstetric characteristics with the birth conditions of newborns. **Method:** Cross-sectional study, quantitative approach with retrospective documentary technique. The data are related to the births that took place in a public institution in the state of Rio de Janeiro (RJ), between January and June 2015. **Results:** 723 births were analyzed, 70.1% of which were considered at term, and the abdominal delivery occurred in 48.7% of births. Among adolescents, 20% of deliveries were considered preterm. Of the newborns with APGAR from 3 to 6, 67.4% were born via the abdominal route, and those who obtained the highest percentage of severe suffering were those considered preterm (40%), 5.7% of the newborns were classified with PIG. Young adult women were the ones that newborns had the best APGAR index in the 1<sup>st</sup> and 5<sup>th</sup> minute. **Conclusion:** There is an influence of maternal and obstetric characteristics on the neonatal profile and the newborn's vitality shortly after delivery. This fact ratifies that the current public policies must be complied with to qualify the care for childbirth and birth based on the premise that giving birth and birth are physiological events and deserve attention and professional qualification.

**Descriptors:** Health Profile; Newborn; Parturition; Child Health; Women's Health; Comprehensive Health Care

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#### RESUMO

**Objetivo:** descrever a relação entre as características maternas e obstétricas com as condições de nascimento dos recém-nascidos. **Método:** estudo transversal, com abordagem quantitativa, que utilizou a técnica documental retrospectiva. Os dados são relativos aos partos ocorridos em uma instituição pública do estado do Rio de Janeiro (RJ), entre janeiro e junho de 2015. **Resultados:** analisaram-se 723 partos, sendo 70,1% considerados a termo, e a via de parto abdominal ocorreu em 48,7% dos nascimentos. Dentre as adolescentes, 20% dos partos foram considerados pré-termo. Dos recém-nascidos com APGAR de 3 a 6, 67,4% nasceram por via abdominal e os que obtiveram maior percentual de sofrimento grave foram os considerados pré-termo (40%); 5,7% dos recém-nascidos foram classificados com PIG. As Mulheres adultas jovens foram as que os recém-nascidos obtiveram melhor índice APGAR no 1° e no 5° minuto. **Conclusão:** há influência das características maternas e obstétricas no perfil neonatal e na vitalidade do recém-nascido logo após o parto. Tal fato ratifica que as políticas públicas vigentes devem ser cumpridas a fim de qualificar a atenção ao parto e nascimento baseados na premissa de que parir e nascer são eventos fisiológicos e merecem atenção e qualificação profissional.

**Descritores:** Perfil de Saúde; Recém-Nascidos; Parto; Saúde da Criança; Saúde da Mulher; Assistência Integral à Saúde.

## RESUMEN

**Objetivo:** Describir la relación entre las características maternas y obstétricas con las condiciones de nacimiento de los recién nacidos. **Método:** Estudio transversal, con abordaje cuantitativo con técnica documental retrospectiva. Los datos se relacionan con los partos ocurridos en una institución pública del estado de Río de Janeiro (RJ), entre enero y junio de 2015. **Resultados:** Se analizaron 723 partos, de los cuales el 70,1% se consideraron a término, el parto abdominal ocurrió en el 48,7% de los nacimientos. Entre las adolescentes, el 20% de los partos se consideraron prematuros. De los recién nacidos con APGAR de 3 a 6, el 67,4% nacieron por vía abdominal y los que obtuvieron mayor porcentaje de sufrimiento severo fueron los considerados pretérmino (40%), el 5,7% de los recién nacidos fueron clasificados con PIG. Las mujeres adultas jóvenes fueron las que tuvieron el mejor índice APGAR en los recién nacidos en el 1° y 5° minuto. **Conclusión:** Existe una influencia de las características maternas y obstétricas en el perfil neonatal y en la vitalidad del recién nacido poco después del parto. Este hecho ratifica que deben cumplirse las políticas públicas vigentes para calificar la atención al parto y al nacimiento bajo la premisa de que el parto y el nacimiento son eventos fisiológicos y merecen atención y calificación profesional.

**Descriptores:** Perfil de Salud; Recién Nacido; Parto; Salud del Niño; Salud de la Mujer; Atención Integral de Salud.

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**INTRODUCTION**

In Brazil, there is great variability in the standard of care of the healthy or unhealthy newborn, as the characteristics of both the public assisted and the institution are considered. Thus, the interventions carried out with the binomial since the beginning pre-delivery, in the delivery room, until postpartum, depend on several factors, such as the health conditions in which these babies were generated and how they were born and this will guide actions to be implemented with them.<sup>1</sup>

According to the Ministry of Health, there are important variables to define the vitality and conditions of birth and characteristics of newborns, aiming at good assistance; Among these data, there are weight, height, twinning, gestational age, maternal age, and APGAR at the 1<sup>st</sup> and 5<sup>th</sup> minute. The monitoring of these variables, especially the APGAR score, allows the identification of the need to implement new educational programs and to improve newborn care for health professionals.<sup>2</sup> Knowing these parameters, it is essential to support comprehensive and directional care, with a reduction in the possibility of errors and risks to the health of the mother and the newborn<sup>3</sup>. This is due to the influence that each of these parameters has on the other, such as the implication of the mode of delivery on the physiological and vitality conditions of newborns.<sup>4-5</sup>

Knowledge about the profile of childbirths and births in an area covered, and comparing them with national and international parameters, allows proposing specific health actions for individuals, as well as planning focal interventions and according to specific needs of populations, allowing for evidence-based maternal and perinatal health planning<sup>6-8</sup>.

Identifying these conditions and their impact on births ensures the possibility of proposing appropriate protocols, in addition to providing timely interventions that guarantee the health of the mother-baby binomial, based on the needs of each one.<sup>11</sup>

We believe that knowing the profile of births will guide the actions of the entire health team, including and mainly nursing, in a way that allows the assessment of relevant factors for adequate care in the municipality's maternity hospital, enabling to plan actions in an assertive and apply the actions proposed by the Ministry of Health considering the reality of each location, considering that the reality of one does not always apply to the other. Therefore, it is relevant a specific study that contributes to the knowledge about the peculiarities of each territory.<sup>12</sup>

**OBJECTIVE**

To describe the relationship between maternal and obstetric characteristics with the birth conditions of newborns.

**METHOD**

This is a cross-sectional study, with a quantitative approach that used the retrospective documentary technique. It was carried out in a public maternity hospital, in a municipality in the coastal lowlands of the state of Rio de Janeiro (RJ). The primary source of data for the study was the institution's birth registration books and the medical records of the assisted parturient women.

We included in the research all parturient women attended at the institution in labor and delivery from January to June 2015. We excluded those women who had deliveries of stillborn and twin babies. As this is a retrospective and documentary study, with no direct contact with the study participants, the use of the Informed Consent Term was waived.<sup>13</sup>

The following variables were studied: maternal age, mode of delivery, gestational age, APGAR in the 1<sup>st</sup> and 5<sup>th</sup> minutes, weight and height of the newborn. Data collection was carried out from January to December 2018. Data analysis involved descriptive statistics (simple frequency, mean, median, and standard deviation). Data processing was carried out using the public domain program R (R Foundation for Statistical Computing).

This study was approved by the Ethics and Research Committee (CEP) of Hospital Universitário Antônio Pedro (HUAP), under CAAE nº 52649615.2.0000.5243. It is part of the research project “Birthing and Being Born in Rio das Ostras/RJ”, with funding PIBIC/CNPQ.

**RESULTS**

We analyzed 723 births performed at the institution. The parturient women´s age was from 13 to 47 years old, with an average of 23 years old, of these 204 (28.2%) were adolescents, 452 (62.5%) young adults and 59 (8.1%) adults over 35 years old.

Regarding their gestational age, there was a minimum of 23 and a maximum of 43 weeks, with 507 (70.1%) of deliveries being considered at term, with an average of 39 weeks.

As for the height of the newborn, there was an average of 50 cm, with a maximum of 57 and a minimum of 26 cm. Regarding birth weight, the maximum was 4830 kg and the minimum 1000 kg, average 3225 kg.

The classification of Weight X Gestational Age was used and the data were grouped into Adequate for Gestational Age (AGA) 10<sup>th</sup> to 90<sup>th</sup> percentile, Small for Gestational Age (SGA) less than the 10<sup>th</sup> percentile, and Big for Gestational Age (BGA) above the 90<sup>th</sup> percentile. Of these data, 433 (59.9%) were considered BGA and only 41 (5.7%) AGA.

Regarding the mode of delivery, 368 (48.7%) were abdominal and 355 (47.0%) vaginal delivery (Table 01).

Table 1. Distribution of variables: maternal age, gestational age, newborn weight, and route of birth.

Age of the Parturient woman	n	%
Adolescent	204	28,2
Young Adults	452	62,5
Adults	59	8,1
Not informed	8	1,1
Total	723	100
Gestational Age	n	%
At term	507	70,1
Pre-term	87	12
Post-term	18	8,1
Not informed	111	15,4
Total	723	100
Weight at birth	n	%
AGA	433	59,9
BGA	133	18,4
SGA	41	5,7
Not informed	116	16
Total	723	100
Mode of delivery	n	%
Abdominal	368	50,9
Vaginal	355	49,1
Total	723	100

Regarding APGAR in the first minute of life, 650 (89.9%) of the babies were born without difficulties in adapting to extrauterine life, only 15 (2.1%) were born with severe suffering, and 46 (6.4%) with moderate difficulty in adaptation. In the second APGAR measurement, performed at the 5<sup>th</sup> minute of life, there was a significant improvement in the newborn's adaptation, with only 7 (1.0%) records of severe suffering and 7 (1.0%) of moderate adaptation difficulty.

In the analysis of maternal age and mode of delivery, we observed that there was no significant difference in the relationship between the variables. Among adolescents (n = 204), 103 deliveries occurred by abdominal route (50.5%), representing 14.2% of the total births in the institution and 101 (49.5%) were vaginal. Young adults, aged 20 to 34 years old, represent the highest proportion of deliveries (n = 452). In the analysis of the delivery routes, we observed that among them, 50% of deliveries were performed by the abdominal route and 50% were vaginal, both representing 31.3% of the total deliveries performed at the maternity hospital. Among adult parturient women, 56% of deliveries were abdominal. We highlight the large number of births by abdominal route regardless of the age group analyzed (Figure 1).

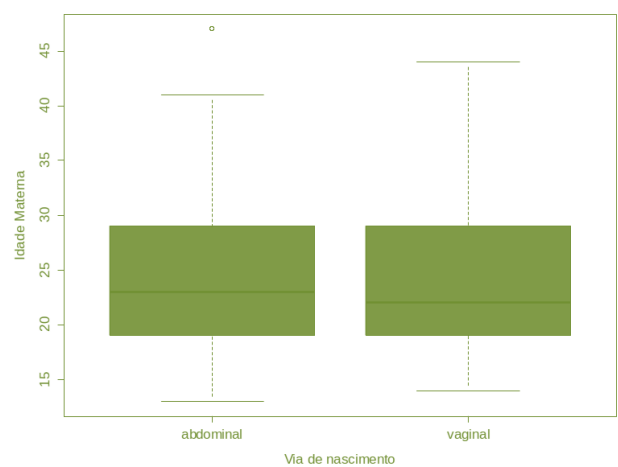


Figure 1: Boxplot of maternal age-related to the way of birth. Rio das Ostras (RJ). Brazil, 2019.

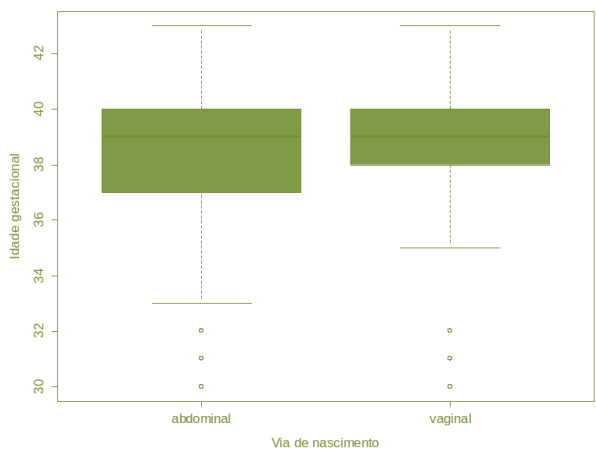
Among young adults, there was a greater number of deliveries considered at term (75.6%), totaling 47.3% of deliveries. Among adolescents, 20% of deliveries were considered preterm.

In the analysis of APGAR data in the first minute of life, we found that most of the deliveries obtained APGAR between 7 and 10, both in the vaginal (44.5% of the total deliveries) and abdominal delivery (45%). In the total of deliveries with APGAR from 3 to 6 (moderate difficulty of adaptation), 67.4% occurred by abdominal route. The mode of delivery with the highest proportion of APGAR from 0 to 3 (severe suffering), were also performed via the abdominal route (66.6%). In the analysis of APGAR at the 5<sup>th</sup> minute, there was an improvement in the results in both types of delivery.

Newborns considered at term had a better APGAR index of 7 to 10 (63.9%) than newborns who were born post-term (2.3%) and preterm (9.2%). Those who obtained a higher percentage of severe suffering at birth were newborns considered preterm, compared to the others (40%).

Young adult women were the ones that newborns had the best APGAR index both in the 1<sup>st</sup> and 5<sup>th</sup> minutes of extra-uterine life (57.1% and 60.1%, respectively). The APGAR index that appeared less frequently in the 1<sup>st</sup> minute was considered severe suffering, from 0 to 3, in young adult women (15.2%), adolescents (5%), and women over 35 years old (0%).

Among the births considered preterm, a large percentage of them occurred through the abdomen (63.2%). Of the term deliveries, 258 occurred vaginally while 249 were performed via the abdominal route. Among the total deliveries analyzed, post-term deliveries were the ones that were least performed, 8 of them by abdominal and 10 by vaginal route (Figure 2).



**Figure 2: Boxplot of gestational age-related to the route of birth. Rio das Ostras (RJ). Brazil, 2019.**

## DISCUSSION

Maternal age was categorized into “Adolescents”: 13 to 19 years old, “Young Adult”: 20 to 34 years old, and “Adults” over 35 years old.<sup>9</sup> After analyzing the data on maternal age, we observed a large percentage of parturient women under 20 years old (28.2%). The Brazilian reality has a slightly lower rate of adolescent pregnancy of approximately 16.5% of the total deliveries.<sup>14</sup> The results referring to maternal age are similar to those obtained by a comparative study conducted with 29 countries in Africa, Asia, Latin America, and the Caribbean that shows an average proportion of adolescent pregnancies of 25.9% between 2010 and 2011.<sup>15</sup>

The study showed high rates of cesarean sections being performed at the maternity hospital (47.0%). Research developed with data from public health institutions reveals a data of 55.5% of deliveries being performed through the abdominal route.<sup>16</sup> This reflects the Brazilian reality in which in 2017, surgical delivery was performed in 55.6% of deliveries and 57.7% in the state of Rio de

Janeiro<sup>14</sup>, according to the World Health Organization (WHO), high cesarean rates increase maternal and neonatal mortality by up to 10 %.<sup>17</sup>

In this study, there was no relevant association between the variables: maternal age and mode of delivery, similar to maternities in the north of Espírito Santo, which obtained a significant ratio of  $p > 0.05$  in the association of the variables.<sup>18</sup> However, women over 35 years old have a higher risk of having abdominal deliveries in line with a study carried out in Paraná, in which cesarean delivery had a risk 1.68 times higher in adult women than in young adults.<sup>19</sup> Other studies still corroborate that women under 20 years old would be statistically less likely to perform cesarean sections when compared to the other groups, reaching rates of 58 to 61% of deliveries performed in institutions.<sup>20-</sup>

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Gestational age is classified as: “at term” from 37 to 41 weeks of gestation, “preterm” from 22 to 36 weeks, and “post-term” greater than 41 weeks. Among deliveries performed at the institution, prematurity occurred in 12%, similar to another study, in which premature births occurred in 17.8% of births, that is, every 30 women, 5 did not reach 37 weeks of gestation.<sup>9</sup> The highest number of premature births occurred among pregnant adolescents, in line with several studies carried out in Brazilian states that point out that women of extreme age, younger than 20 years old and older than 35 years would have a greater recurrence of prematurity.<sup>19; 22-23</sup> This is similar to international data, from a population study carried out in developing countries, where the incidence of premature births among adolescents was 13.6%.<sup>24</sup> In another study carried out in Guadalajara, Mexico, a statistically significant difference was also observed in newborns of adolescent mothers, in which they were more likely to have low weight, stunted growth, and prematurity, a factor that is associated by the authors, to the adolescent's nutritional conditions during pregnancy, due to low economic resources and conditions of poverty, which increase the chances of pregnancy in adolescence due to the lack of information and resources.<sup>13</sup>

In the first evaluation of the newborn, the APGAR score is evaluated in the first and fifth minutes of life, categorized in this study from 0 to 3 representing severe suffering, from 4 to 6 representing moderate difficulty to extra-uterine adaptation, and from 7 to 10 which indicates the absence of adaptation difficulties.<sup>25</sup> The data referring to this score indicate a higher proportion of newborns with scores between 7 and 10 (89.9% in the first minute), that is, without difficulties in adapting to extra life uterine, independent of other factors similar to another study carried out in Brazil.<sup>9</sup>



However, when the data are compared to the mode of delivery, there was a significant difference between those born through the abdominal and vaginal route, with the newborns through the abdominal route being more likely to score less than 7. This is similar to a study carried out with 150 newborns in Rio Grande do Sul, in which those born by vaginal route had better physiological and vitality conditions compared to those born by abdominal route.<sup>4</sup> A study carried out in Argentina also corroborates these data, in which 75.3 % were by the vaginal route and the APGAR score of 8 to 10 was found in more than 90% of births.<sup>5</sup>

Newborns with a gestational age between 37 and 42 weeks had better vitality at birth compared to the others. In a cohort study conducted with data from Sweden, the low APGAR index (less than 7) is more frequent in newborns with a gestational age greater than or equal to 42 weeks, this fact being strongly associated with a higher risk of neonatal morbidity and mortality.<sup>26</sup>

Regarding the APGAR index in the first and fifth minutes, this study showed that young adult women, despite having APGAR greater than 7 in a greater proportion, compared to other age groups, also present an increased risk with APGAR index less than 7 with the adolescents. Together with other studies, we can confirm that the extremes of age, be it adolescence or the age of over 35, are risks that must be considered when related to perinatal and also maternal outcomes, as these age groups are more susceptible to the score of APGAR less than 7, which is related to a greater chance of neonatal depression.<sup>19; 23</sup>

Adolescent mothers, aged 10 to 14 years old, have a 1.82 times greater chance of the birth of a baby with an APGAR index less than 7 in the fifth minute when compared to the others, indicating an unfavorable physical condition of the newborn.<sup>20</sup> Going against these data, a study carried out in Mexico, compared the vitality and neonatal characteristics between adolescent and non-adolescent mothers, and showed no statistically significant difference in APGAR at 1 and 5 minutes between them, despite having found that newborns of adolescent mothers are more prone to illnesses after birth and that the probability of changes in the clinical profile of these babies is 1.58 times higher in adolescent mothers, due to the vulnerability and unpreparedness, both physical and emotional, of these women in dealing with these pregnancies.<sup>16</sup>

Of the deliveries performed at the institution, most deliveries considered preterm were performed via the abdominal route (63.2%), often without adequate obstetric indications, putting the vitality and health of both the newborn and the mother at risk.<sup>27; 17</sup> In a study carried out with data referring to public and private health institutions in Brazil, corroborates the existence of this

practice, showing that among the deliveries where the cesarean section was performed, 85.8% were still considered premature pregnancies.<sup>21</sup>

The results obtained show a great influence of both maternal and obstetric characteristics on the neonatal profile and the newborn's vitality shortly after delivery, demonstrating the importance of monitoring maternal and fetal conditions from the moment of conception.

The rate of cesarean section found in the studied institution is at high levels, and those presented in other studies, both national and international, and the importance of its reduction is emphasized, considering that they increase the risks for both mother and the newborn, as a decrease in the APGAR score, suggesting less vitality at birth. Maternal age was also a determining factor that directly influences the birth conditions of the newborn, highlighting the importance of public policies that reduce pregnancy rates in adolescence and old age, as they affect birth weight, APGAR, and increases births with early gestational age.

## CONCLUSION

The results obtained show a great influence of both maternal and obstetric characteristics on the neonatal profile and the newborn's vitality shortly after delivery, demonstrating the importance of monitoring maternal-fetal conditions from the moment of conception until birth.

The rate of cesarean section found in the studied institution is at high levels, and those presented in other studies, both national and international, and the importance of its reduction is emphasized, considering that they increase the risks for both mother and the newborn, as a decrease in the APGAR score, suggesting less vitality at birth. Maternal age was also a determining factor that directly influences the birth conditions of the newborn, highlighting the importance of public policies that reduce pregnancy rates in adolescence and old age as they affect birth weight, APGAR, and increases births with early gestational age.

We emphasize how much it is necessary to evolve to achieve improvements that positively reach this assistance and birth conditions. The knowledge of these data allows and assists in proposing interventions that can qualify the care for childbirth and birth based on the premise that childbirth and birth are physiological events and that deserves attention and professional qualification.

The results obtained in the study enabled us to reflect on the need for qualified assistance to women and newborns to reduce complications and assist in the birth of healthy babies with good vitality. Such a study is a theoretical support reference for the urgent implementation of intervention

measures that invest in the permanent education of all health professionals who participate in the care of women and newborns, during pregnancy, childbirth, and postpartum.

**CONTRIBUTIONS**

All authors also contributed in the conception of the article, collection, analysis and discussion of the data, as well as in the writing and critical review of the content with intellectual contribution and in the approval of the final version of the study.

**CONFLICTS OF INTERESTS**

Nothing to declare.

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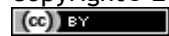
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