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FACTORS RELATED TO THE PERFORMANCE OF CESAREAN SECTIONS IN THE STATE OF MINAS GERAIS BETWEEN 2010 AND 2020

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Abstract: Goal: To evaluate the sociodemographic profile of women undergoing cesarean section in Minas Gerais from 2010 to 2020. Methods: Ecological time series study of cesarean section rates, correlating them with sociodemographic variables and Robson's classification. Data were collected at SINASC, from DATASUS. **Results:** A total of 57.1% of births in Minas Gerais in the last decade were by cesarean section, with the highest rates among women with higher education and over 30 years of age, those between 28 and 36 weeks of gestation, and in parturients in group 5 of Robson, composed of women with a single fetus, at term and with a previous cesarean section. The impact of cesarean section rates is not just financial, it also brings risks to the health of the mother and baby. Conclusion: Cesarean sections are prevalent in women over 30 years of age, with a high level of education, previous cesarean section or nulliparous women who have never gone into labor. Vaginal birth rates are highest in full-term and extremely premature fetuses. The high rates contradict international recommendations and highlight the need to encourage vaginal birth in all pregnant women.
Keywords: cesarean section; cesarean section; vaginal birth after cesarean section; normal birth; childbirth; labor

INTRODUCTION

Labor and birth were physiological events that occurred at home, with other women and midwives, and became biomedical events in a hospital environment and surrounded by interventions. Among the various changes, cesarean section emerged as a surgery to help reduce maternal and neonatal morbidity and mortality.[1,2]. However, like any surgery, it can bring complications and, for this reason, it must only be performed when its benefits outweigh these risks, as in cases of cephalo-pelvic disproportion and total placenta previa[1].

As a way to evaluate, monitor and compare cesarean section rates in different services and locations, the use of the Robson Classification was proposed, which divides pregnant women into 10 mutually exclusive groups based on the obstetric characteristics of parity, number of fetuses, previous cesarean section, onset of labor, gestational age and fetal presentation. With this classification, it is possible to identify the groups that contribute most to the cesarean section rate and plan interventions to reduce these numbers.[2,4].

Robson groups 1 to 4 refer to women without a previous cesarean section. Groups 1 and 2 include nulliparous women with a single, cephalic and full-term fetus, with the first group consisting of those who went into spontaneous labor and the second group of those who had labor induction or cesarean section before the start of labor. Groups 3 and 4 contain multiparous women with a single, cephalic and full-term fetus, the former with spontaneous labor and the latter with induction of labor or cesarean section before it begins.[4,5].

The Group 5 includes all multiparous women with a previous cesarean section, with a single, cephalic and full-term fetus. Groups 6 and 7 include pregnancies with a single and breech fetus, with the first group being nulliparous and the second being multiparous. Group 8 includes all multiple pregnancies, 9 includes those with a transverse or oblique fetus, and group 10 includes all pregnant women with a single, cephalic and premature fetus.[4,5].

Although the World Health Organization (WHO) and Ministry of Health (MS) guide surgical birth rates below 15% [2], The reality of Brazilian maternity hospitals is far from ideal with almost 70% of all births in the country being by cesarean section in 2020 [3], which

has consequences for women in labor and for the Unified Health System. The present study, for this reason, aims to evaluate the profile of women undergoing cesarean sections in the state of Minas Gerais between 2010 and 2020.

METHODS

This is an ecological time series and retrospective study with data on births in the state of Minas Gerais, from 2010 to 2020. Data collection took place between December 2022 and January 2023. The study population consisted of for all births in the state of Minas Gerais between 2010 and 2020 and registered in the Information Technology Department of the Unified Health System - DATASUS, totaling 2,851,812 births. To obtain the data, the following steps were followed: DATASUS > ACCESS TO INFORMATION > TABNET > SECTION: VITAL STATISTICS > LIVE BIRTH - since 1994 > Live birth > Brazil by Region and Federation Unit (http://tabnet.datasus.gov. br/cgi/deftohtm.exe?sinasc/cnv/nvuf.def) and using the filters: line - mother's age, mother's education, duration of pregnancy and Robson groups; column - type of birth; content - in the residence. mother; available periods: 2010 to 2020; available selections: federation unit - Minas Gerais. The central search referred to the method of birth and the comparison between types of birth. The rate for each birth was calculated using the following formulas:

Cesarean sections-year = (number of cesarean sections in a given year) / (total births in that year)

Vaginal births-year = (number of vaginal births in a given year) / (total births in that year)

After data collection, tables were created using Microsoft Excel® software.

RESULTS

Throughout the studied period, 2,851,812 births were registered in the state of Minas Gerais, 57.10% of which were cesarean sections, 42.60% normal births and 0.19% with an unregistered birth method (Table 01). This pattern prevailed throughout all years of the study, as shown in Table 01.

Year of birth	Cesarean 1630495 (57,10%)	Vaginal 1215852 (42,60%)	Ignored 5465 (0,19%)
2010	54,06%	45,76%	0,16%
2011	55,55%	44,15%	0,28%
2012	57,46%	42,19%	0,33%
2013	58,54%	41,64%	0,41%
2014	58,11%	41,67%	0,20%
2015	56,55%	43,22%	0,22%
2016	56,90%	42,90%	0,17%
2017	57,54%	42,31%	0,14%
2018	57,99%	41,90%	0,09%
2019	58,11%	41,81%	0,07%
2020	58,55%	41,36%	0,08%

Table 01: Dados sobre as vias de parto em Minas Gerais anualmente entre 2010-2020

Another point observed during the study was that the rate of cesarean sections increased proportionally to the maternal age group, prevailing over the vaginal route in groups of women over 30 years of age, as shown in Table 02.

Maternal age	Cesarean	Vaginal	Ignored	Total
<20 years	170524 (40,46%)	249968 (59,30%)	970 (0,23%)	421462
20 to 29 years	752560 (54,31%)	630248 (45,48%)	2833 (0,20%)	1385641
30 to 39 years	645541 (67,43%)	310139 (32,40%)	1536 (0,16%)	957216
≥40 years	61860 (29,13%)	25486 (70,72%)	123 (0,14%)	87469
Ignored	10 (41,66%)	11 (45,83%)	3 (12,50%)	24

Table 02: Data on birth routes in Minas Gerais from 2010-2020, according to maternal age.

With regard to gestational age, the groups were divided into extremely premature (≤ 27 weeks), premature (28-36 weeks) and term (≥37 weeks). And it was observed that

the cesarean section rate was prevalent in all births over 27 weeks. (Table 3)

Gestation age	Cesarean	Vaginal	Ignored	Total
≤ 27 weeks	6785 (40,59%)	9898 (59,21%)	31 (0,18%)	16714
28-36 weeks	168574 (58,06%)	121290 (41,78%)	465 (0,16%)	290299
≥ 37 weeks	1425765 (57,30%)	1058302 (42,53%)	3766 (0,15%)	2487833
Ignored	29371 (51,58%)	26.362 (46,30%)	1203 (2,11%)	56936

Table 03: Data on delivery routes in Minas Gerais from 2010-2020, according to gestational age

Analyzing the birth routes according to Robson's Classification, the highest cesarean section rates were found in groups 02, which corresponds to nulliparous women who had labor induction or cesarean section before the spontaneous start of labor, and 05, which includes multiparous women with previous cesarean section. It is important to highlight that, due to the inclusion of the Robson Classification by the World Health Organization in 2015 [4], there was a large number of unclassified births. (Table 4)

Robson groups	Cesarean	Vaginal	Ignored
1	118203 (7,25%)	160292 (13,18%)	262 (4,79%)
2	233108 (14,30%)	105189 (8,65%)	136 (2,49%)
3	44373 (2,72%)	234431 (19,28%)	250 (4,57%)
4	84847 (5,20%)	112281 (9,23%)	150 (2,74%)
5	360133 (22,09%)	40551 (3,34%)	165 (3,02%)
6	25827 (1,58%)	2698 (0,22%)	16 (0,29%)
7	29832 (1,83%)	4541 (0,37%)	19 (0,35%)
8	33202 (2,04%)	7606 (0,63%)	35 (0,64%)
9	3283 (0,20%)	142 (0,01%)	2 (0,04%)
10	85283 (5,23%)	76638 (6,30%)	74 (1,35%)
Not informed	612404 (37,56%)	471483 (38,78%)	4356 (79,71%)
Total	1630495	1215852	5465

Table 04: Data on birth routes in Minas Gerais from 2010-2020, according to Robson's classification

In the variable that corresponds to the level of maternal education, the prevalence of cesarean sections remained high in groups of women with higher education, being higher in the group of women with higher education, followed by women with secondary education (Table 5).

Maternal education level	Cesarean	Vaginal	Ignored	Total
None	3318 (35,05%)	6117 (64,63%)	29 (0,30%)	9464
1 to 7 years	248491 (45,39%)	297435 (54,34%)	1424 (0,26%)	547350
8 to 11 years	913156 (54,70%)	753367 (45,12%)	2805 (0,16%)	1669328
12 years or over	429567 (76,06%)	134551 (23,82%)	633 (0,11%)	564751
Ignored	35963 (59,03%)	24382 (40,02%)	574 (0,94%)	60919
Total	1630495	1215852	5465	2851812

Table 05: data on birth routes in Minas Gerais from 2010-2020, according to level of education

DISCUSSION

This work found data showing that in the last decade more than half of births in the country occurred through surgery, corresponding to projections by the WHO and the Pan American Health Organization (PAHO) that point to a global increase in this practice, which could correspond to a third of births by 2030[6].

In relation to maternal education, the group with the highest cesarean section rates were those women with 12 years of study or more, which corresponds to higher education. The same occurred in the study by Rasador and Abegg8, who also found a 33% prevalence of cesarean sections in these women.

When analyzing the association between maternal age and the route of birth, it was possible to verify that the prevalence of cesarean sections in women over 30 years of age is in line with previous studies. Guimarães et al.7 found a rate of 37.03% of cesarean sections in women with advanced maternal age, while Rasador and Abegg[8] reported a rate of 75.4% in this group. The increase in

the incidence of pregnancies in women of advanced age (late pregnancies) has gained scientific notoriety. Late pregnancies are considered to be pregnancies in women who become pregnant after the age of 35 (regardless of previous parity) or in primigravidae over the age of 28. Despite the increased incidence of pregnant women over 35 years of age, such pregnancies do not contraindicate vaginal birth, which is indicated and encouraged in this age group due to the advantages in maternal recovery after birth.[9].

The gestational age with the highest rate of cesarean sections is births between 28 and 36 weeks, with 58% of births using this route, followed closely by births above 37 weeks, which correspond to rates of 57.30%. Both data, they correspond to what was found in the literature. Dias et al.[10] found prevalence in cesarean section rates from 36 weeks onwards, Toker et at[11] found an increase in this birth route from 34 weeks onwards. For this reason, in 2016, the Federal Council of Medicine published Resolution, number: 2,144/2016 determining that elective cesarean sections must only occur after 39 weeks, after clarifying the risks and benefits of each type of birth for the pregnant woman.[12].

Robson's group with the highest rate of cesarean section in relation to all births was 05, pregnancy with a single fetus, at term and with a previous cesarean section, representing 22%. In sequence, groups 02, 01 and 10 within each group. These results correspond to those found in studies by Soares et al.14 and Knobel et al.l.[15]. Group 02, representing nulliparous women who undergo cesarean section before labor or induction of labor, represent 14% of all cesarean births in the period studied. The fact that the group of nulliparous women has the second highest cesarean section rate, behind only women with a previous cesarean section, shows that it is very important to advocate for vaginal birth in these women, since reducing elective cesarean sections in nulliparous women reduces their recurrence in multiparous, as identified in the study by Alcântara, Almeida and Almeida[16].

In relation to vaginal birth, the largest groups in this study were 1 and 3, as well as other studies found in the literature [13,14].

Rising cesarean section rates don't just have a financial impact, as shown by Entringer, Pinto and Gomes[12], who found costs up to 38% higher in cesarean sections than in vaginal births. The increase in cesarean sections also brings risks to the parturient-neonate binomial, since maternal mortality is higher in surgical births when compared to vaginal births. Cesarean sections can cause early complications to the woman in labor, such as hemorrhage and surgical injuries to the bladder, intestines, ureters and uterine suture dehiscence, and late complications, such as injuries to the ileum, thromboembolic events and dehiscence of the anterior abdominal wall. For newborns, the lack of contact with the maternal vaginal and intestinal flora makes them more susceptible to autoimmune diseases such as diabetes mellitus, Crohn's disease, multiple sclerosis, and allergic diseases such as asthma, allergic rhinitis and atopic dermatitis.

In 2019, Law, number: 17,137 / 2019 was sanctioned in the State of São Paulo, which guarantees pregnant women the possibility of opting for a cesarean birth, through the SUS, from the thirty-ninth week of pregnancy. Such a law could further increase Brazilian cesarean section rates, as misinformation that surgical birth is more beneficial than normal birth could lead the vast majority of pregnant women to opt for such an intervention. With better communication between prenatal doctors and pregnant women, it would not be necessary to carry out such a bill because, with the correct information, only a minority of pregnant women would not opt for a vaginal

birth. With the misinformation that occurs during prenatal care today, such a law could greatly increase the rate of cesarean sections, putting the reproductive health of Brazilian women at risk.

The present study showed that even in primiparous patients and even in multiparous patients, there is still a higher rate of surgical delivery than recommended by the WHO. Reducing cesarean section rates is a multidisciplinary task, which requires effort from the birth care and prenatal care teams, with advice and guidance from the first pregnancy consultation. With better information for pregnant women, prioritizing humanized birth without unnecessary interventions, Brazilian maternity hospitals will provide the best assistance to the maternal-fetal binomial.

CONCLUSION

Cesarean section is the predominant method of birth among women over 30 years of age and with a high level of education in Minas Gerais, as well as among women with a previous cesarean section or in nulliparous women who have never gone into labor. Cesarean section rates were higher in pregnancies with moderately preterm and borderline or full-term fetuses. These results contradict the recommendations of national and international institutions, highlighting the need for educational measures and incentives for professionals and public and private health institutions to promote vaginal birth for all pregnant women, especially those in groups with greater discrepancy.

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