Obstetric characteristics of pregnant women undergoing cesarean section, by the Robson Classification

Características obstétricas das gestantes submetidas à cesariana, segundo a Classificação de Robson

Características obstétricas de las mujeres embarazadas sometidas a cesárea según la Clasificación de Robson

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ABSTRACT
Objective: to describe obstetric characteristics of pregnant women undergoing cesarean section at a University Hospital, by the Robson classification. **Method**: this quantitative, retrospective, descriptive study used secondary data from 294 medical records of pregnant women undergoing cesarean section at the hospital of Maranhão Federal University, from January to December 2015. **Results**: participants were predominantly nulliparous (51.02%), underwent caesarean section before onset of labor (57.15%), with term pregnancies (37.76%) and a single fetus (96.30%) in vertex presentation (90.82%). Robson Classification group 5 (multiparous with at least one previous cesarean section, single fetus, cephalic, ≥ 37 weeks) was the most prevalent (28.23%). **Conclusion**: the caesarean section rate at this hospital is high (49.3%), even for a study at a referral maternity facility for high-risk pregnancies. The study revealed the users' sociodemographic profile and obstetric characteristics, which are important information for planning care.
Keywords: Caesarean; obstetric labor; classification; gestation.

RESUMO
Objetivo: descrever as características obstétricas das gestantes submetidas à cesariana segundo a Classificação de Robson em um hospital universitário. **Método:** descritivo, retrospectivo, com abordagem quantitativa, com dados secundários de 294 prontuários de gestantes submetidas à cesariana no Hospital Universitário da Universidade Federal do Maranhão, no período de janeiro a dezembro de 2015. **Resultados:** predominância de nulíparas (51,02%), submetidas à cesárea antes do início do trabalho de parto (57,15%), com gestação a termo (37,76%), com feto único (96,3%), em apresentação cefálica (90,82%). O grupo da Classificação de Robson com maior prevalência (28,23%), foi o grupo 5 (multíparas com pelo menos uma cesárea anterior, feto único, cefálico, ≥ 37 semanas). **Conclusão:** o hospital apresenta uma alta taxa de cesariana, totalizando 49,3%, mesmo se tratando de um estudo realizado em uma maternidade referência para gestantes de alto risco. A pesquisa permitiu conhecer o perfil sociodemográfico e as características obstétricas das usuárias, dados importantes para o planejamento da assistência.
Descritores: Cesárea; parto obstétrico; classificação; gravidez.

RESUMEN
Objetivo: describir las características obstétricas de las mujeres embarazadas sometidas a cesárea según la clasificación de Robson en un hospital universitario. **Método**: descriptivo, retrospectivo, con abordaje cuantitativo, con datos secundarios de 294 registros médicos de mujeres embarazadas sometidas a cesárea en el Hospital Universitario de la Universidad Federal de Maranhão, en el período de enero a diciembre de 2015. **Resultados**: predominio de nulíparas (51,02%) que se sometieron a cesárea antes del comienzo del trabajo de parto (57,15%), con embarazos a término (37,76%) con un solo feto (96,3%) en presentación cefálica de vértice (90,82%). El grupo de la Clasificación de Robson con mayor prevalencia (28,23%) fue el grupo 5 *(multíparas con al menos una cesárea anterior, feto único, cefálico, ≥ 37 semanas).* **Conclusión**: el hospital tiene una alta tasa de cesáreas, un total de 49,3%, incluso cuando se trata de un estudio realizado en un centro de maternidad de referencia mujeres embarazadas de alto riesgo. La investigación permitió conocer el perfil sociodemográfico y las características obstétricas de las pacientes, datos importantes para la planificación de la asistencia.
Descriptores: Cesárea; parto obstétrico; clasificación; embarazo.

INTRODUCTION

The gestation is a physiological event that involves changes in several aspects: physical, social and emotional and must be experienced by pregnant women and health professionals as a healthy life experience. In contrast, it is a delicate situation that may involve risks for both the mother and the fetus, and there is a group of pregnant women who, by inherent characteristics, may present a greater chance of unfavorable evolution, are the so-called *high-risk pregnant women*[1].

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Over the years the World Health Organization (WHO) has been in a constant movement to build a new paradigm of attention to women's health in the puerperal pregnancy cycle. In this way, full obstetrical care is sought, permeated by quality assistance, guided by assistance practices based on scientific evidence, on the right of women's choices and the minimization of interventions at this moment[2], so is the choice of childbirth, which, while respecting the opinion and the right of women to choose how to give birth, should be based on scientific evidence.

The choice of the woman's child birth method, however, can generate in them opinions of solutions that more satisfy their desires and expectations, independently of the clinical and obstetric conditions and orientations provided in their prenatal care. The female opinion reflecting their autonomy, in a certain way, should be coupled, and not superimposed on the clinically known criteria. The institutionalization of childbirth care and technological advances have achieved greater maternal and fetal benefits, reducing the morbidity and mortality of the puerperal pregnant cycle; however, it is still observed in these procedures the practice of many unnecessary interventions. The high incidence of cesarean deliveries without precise indications is a global concern. The procedure is associated with higher rates of maternal mortality, four to five times higher relative to vaginal sections and it is also associated with perinatal morbidity and mortality[1].

The obstetric care in Brazil is still focused on the biomedical model, which has contributed to the increase of invasive and interventional procedures during labor and, consequently, reflecting the high rates of maternal and perinatal morbidity and mortality[3]. The choice of the child birth method by the medical team is a decision that should be made according to each case and it is essential the clarification of the pregnant woman and her family, with accurate information and in a way that is comprehensible to them, regarding the existing options and the risks of each of them, ensuring the participation of pregnant women in the decision-making process. It should be noted that pregnancy risk is not a synonymous for cesarean section. In some cases it is possible to induce vaginal section, or even wait for its spontaneous onset[1].

Ideally, the cesarean operation is a safe procedure and with low frequency of severe complications. In addition, when performed for medical reasons, cesarean section is effective in reducing maternal and perinatal mortality. However, it is often used unnecessarily, without medical reasons that may justify the high rates observed in Brazil[4]. The vaginal section is safer for both mother and baby because maternal morbidity is frequent and more severe after cesarean section[5].

The cesarean sections without medical indication are associated with a higher risk of puerperal infection, maternal mortality and morbidity, prematurity, neonatal mortality and consequent increase of expenses for the health system. The search for factors that justify these increases is essential so that solutions can be thought[1].

Therefore, as a way to evaluate and monitor the cesarean rate of the hospital under study, the research aimed to verify the obstetric characteristics of pregnant women submitted to cesarean section according to the Robson Classification.

LITERATURE REVIEW

In 1985, the international medical community stated that the ideal cesarean rate would be between 10% and 15%. However, cesarean sections have increased in both developed and developing countries[6]. This increase in the number of cesareans has been analyzed and discussed worldwide and has become a public health issue since, when used unnecessarily, it may represent an additional risk for the mother-baby binomial[7].

In Brazil, the situation is no different. In many hospitals, abdominal section has become the norm: Brazil is now one of the countries with the highest cesarean rates worldwide. More than just a rate on the way of childbirth, the high cesarean rate indicates the degree of over-medicalization of the maternity in which the country is located[8].

According to the WHO, still no international classification is used to facilitate the identification of cesarean rates, significantly, in the maternities of several cities or regions. However, some obstetric characteristics have been studied in order to evaluate the indications of cesarean sections. The knowledge and adequate identification of the risk factors for cesarean section are of fundamental importance to plan health actions aimed at the prevention of maternal-infant morbidity and mortality[6].

Proposed by physician Michael Robson in 2001, the classification of the 10 groups (also known as *Robson classification*) has been widely used in recent years. This classification groups pregnant women according to their obstetric characteristics[6].

This system classifies all pregnant women into one of 10 groups that are mutually exclusive and fully inclusive. The groups are created based on five parameters that are routinely collected in all maternities, allowing a comparison

between cesarean rates without many confounding factors. These factors were: parity (nulliparous or multiparous with and without previous cesarean section); initiation of labor (spontaneous, induced or cesarean section prior to labor); gestational age (preterm or full term); fetal status (cephalic, pelvic or transverse) and number of fetuses (single or multiple).

The classification is simple, robust, reproducible, clinically relevant, and prospective - which means that all pregnant women admitted to labor can be immediately classified into one of 10 groups using only some of these basic characteristics. Classification allows comparison and analysis of cesarean rates within and between these groups[6].

The WHO proposes that the Robson Classification is applied as a standard instrument worldwide to assess, monitor and compare cesarean rates over time in the same hospital and between different hospitals[6].

METHODOLOGY

This is a field survey, descriptive, retrospective, quantitative approach, with secondary data obtained from the medical records of pregnant women submitted to cesarean section in 2015. Held at the Medical Archive Service (SAME) of the University Hospital of the Federal University of Maranhão (HUUFMA) – Maternal and Child Unit and President Dutra Unit. It is a research in the Hospital-Maternity, of tertiary level, reference for high-risk pregnancies. Data collection took place in December 2016 to February 2017.

It was excluded those patients whose identification information was not readable and the medical records were not located, as well as those whose birth product was a dead fetus (one born weighing more than 500 g and having no evidence of life after birth).

The records of the births, performed in the year 2015, were requested at the Obstetrical Surgical Center, which includes the patient's file number, name, procedure performed and date. It was requested to SAME the availability of records for tracking and data collection.

During this period there were 3454 childbirths, of which 1750 (50.7%) were normal and 1704 (49.3%) were cesarean sections. Of the 1704 cesarean childbirth, a sample of 314 medical records (18.4%) was defined, which were selected in a systematic way (chosen from 5 out of 5). These 314 medical records represent 18.4% of cesarean sections, for a sample error of 5%, for a 95% confidence interval, (p <0.05).

All the medical records of the sample were from cesarean sections of live fetuses, since, according to the exclusion criteria, abortions and dead fetuses were eliminated before data collection. Of the 314 medical records, 12 were not located due to inconsistency in the identification numbers of the medical records and eight were lost due to lack of data that compromised the results of the survey, resulting in 294 medical records in the sample.

Data collection was done by completing an *online* form, the variables collected comprised sociodemographic and obstetric characteristics, taking into account the Robson Scale Classification.[6] Parity data (nulliparous or multiparous with and without previous cesarean section) were analyzed, onset of labor (spontaneous, induced or caesarean section before the onset of labor), gestational age (preterm or full term), fetal condition (cephalic, pelvic or transverse) and number of fetuses (single or multiple).

The patients were grouped in one of the 10 groups of the Classification[6] according to the peculiarities of gestation. Group 1 (nulliparas, single fetus, cephalic, ≥ 37 weeks in spontaneous labor); group 2 (nulliparous, single fetus, cephalic, ≥ 37 weeks, whose labor is induced or who undergo cesarean section prior to labor), group 3 (multiparous without previous cesarean section, single fetus, cephalic, ≥ 37 weeks, in spontaneous labor); group 4 (multiparous without previous cesarean section, single fetus, cephalic fetus, ≥ 37 weeks whose labor is induced or who undergo cesarean section prior to labor), group 5 (all multiparous with at least one previous cesarean section, single fetus , cephalic, ≥ 37 weeks); group 6 (all nulliparous with single fetus in pelvic presentation). Continuing, group 7 (all multiple with single fetus in pelvic presentation, including those with previous cesarean section (s)); group 8 (all women with multiple gestation, including those with previous cesarean section (s)); group 9 (all pregnant women with transverse or oblique position, including those with previous cesarean section (s)); group 10 (all pregnant with single fetus and cephalic, <37 weeks, including those with previous cesarean section (s)).

The data were tabulated and analyzed through the *Microsoft Office Excel* 2010 program, being then organized and the variables were demonstrated in tables.

The research project was submitted to the Scientific Committee and to the Research Ethics Committee of HUUFMA and approved under No. 1,872,029.

RESULTS AND DISCUSSION

Two hundred and ninety four medical records of pregnant women were analyzed undergoing cesarean section in 2015. Age ranged from 15 to 35 years or older, with 135 (45.92%) from 16 to 25 years, 122 (41.50%) from 26 to 34 years old and 33 (11.22%). with 35 years or more. As to the marital situation, 118 (40.14%) were in a stable union, 106 (36.05%) were single and 67 (22.79%) were married. In relation to schooling, the majority, 156 (53.06%), had complete the secondary level (2nd grade) and 215 (73.13%) declared themselves as brown, as shown in Table 1.

TABLE 1: Sociodemographic characterization of pregnant women undergoing cesarean section in the year 2015. São Luís-MA, 2017. (N=294)

Variables	f	%
Age group		
Up to 15 years	4	1.36
16 to 25 years	135	45.92
26 to 34 years	122	41.50
35 years or more	33	11.22
Marital status		
Married	67	22.79
Single	106	36.05
Stable union	118	40.14
Divorced	1	0.34
No information	2	0.68
Schooling		
Can't read/write	1	0.34
Complete fundamental level (1st grade complete)	16	5.45
Incomplete fundamental level (1st grade incomplete)	36	12.24
Complete secondary level (2nd grade complete)	156	53.06
Incomplete secondary level (2nd grade incomplete)	41	13.95
Higher education degree	19	6.46
Incomplete Higher education	19	6.46
No information	6	2.04
Race		
Asian	1	0.34
Caucasian	43	14.63
Black	35	11.90
Brown-skinned	215	73.13

Regarding parity, 150 (51.02%) of the pregnant women were nulliparous, and 108 (36.74%) were multiparous with previous cesarean section. Regarding the onset of labor, a predominance was observed in the number of cesarean sections performed prior to the onset of labor - 168 (57.15%). Meanwhile 83 (28.23%) parturient went into spontaneous labor, but for some reason they were referred for cesarean section. Considering the gestational age, it was observed that 111 (37.76%) deliveries were at term and 45 (15.30%) premature. Regarding the fetal status, 267 (90.82%) of the fetuses were in the cephalic position, while 24 (8.16%) in the pelvic position. Regarding the number of fetuses, 283 (96.30%) of the patients had gestation with a single fetus, as described in Table 2.

From the obstetric characteristics, when distributing the pregnant women within the 10 groups of the Robson Classification, it is noted that the highest occurrence of cesarean section, 83 (28.23%), was found in group 5 (all multiparous with at least one cesarean section (nulliparas, single fetus, cephalic, ≥ 37 weeks, whose section is induced or who undergo cesarean section prior to labor) with 72 (24.49%), as shown in Table 3.

When comparing group 5 with groups of pregnant women with similar characteristics, in this case groups 3 (multiparous without previous cesarean section, single fetus, cephalic, ≥ 37 weeks in spontaneous labor) and 4 (multiparas without previous cesarean section, single fetus, cephalic, ≥37 weeks, whose section is induced or who underwent cesarean section prior to labor), the rates of caesarean sections were lower, being 7 (2.38%) and 20 (6.80%), respectively.

Caesarean rates may vary by several factors, including socioeconomic, cultural and obstetric factors. According to the Ministry of Health[4], Brazil is experiencing an epidemic of cesarean operations, with approximately 1.6 million

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cesarean operations performed each year. In recent decades, the national rate of cesarean operations has progressively increased, and cesarean section has become the most common mode of birth in the country. The rate of cesarean operation in Brazil is around 56%, with a significant difference between private health services (85%) and public health services (40%), considerably lower, but still high, based on WHO's rate of up to 15%[9].

TABLE 2: Obstetric characteristics of pregnant women undergoing caesarean section in the year 2015 according to the Robson classification. São Luís-MA, 2017. (N=294)

Variables	f	%
Parity		
Nulliparous	150	51.02
Multipara without previous cesarean section	36	12.24
Multipara with anterior cesarean section	108	36.74
Beginning of labor		
Spontaneous	83	28.23
Induced	43	14.62
Cesarean section before labor begins	168	57.15
Gestational age		
< 37 weeks	45	15.30
37 weeks to 38 weeks and 6 days	75	25.51
39 weeks to 40 weeks and 6 days	111	37.76
41 weeks to 41 weeks and 6 days	48	16.33
> 42 weeks	15	5.10
Fetal status		
Cephalic	**267**	90.82
Pelvic	24	8.16
Transverse	3	1.02
Number of fetuses		
Single	283	96.3
Multiple	11	3.7

TABLE 3: Distribution of pregnant women submitted to caesarean section in the year 2015, according to Robson classification. São Luís-MA, 2017.

Robson groups	f	%
Group 1 - Nulliparous, single fetus, cephalic, ≥ 37 weeks in spontaneous labor	42	14.29
Group 2 - Nulliparous, single fetus, cephalic, ≥ 37 weeks, whose labor is induced or who undergo cesarean section prior to labor	72	24.49
Group 3 - multiparas without previous cesarean section, with single fetus, cephalic, ≥ 37 weeks in spontaneous labor	7	2.38
Group 4 - multiparas without previous cesarean section, with single fetus, cephalic, ≥ 37 weeks, whose labor is induced or who undergo cesarean section before labor begins	20	6.80
Group 5 - all multiparous with at least one previous cesarean section, with single fetus, cephalic, ≥ 37 weeks	83	28.23
Group 6 - all nulliparous with single fetus in pelvic presentation	12	4.08
Group 7 - all multiples with single fetus in pelvic presentation, including those with previous cesarean section (s)	9	3.06
Group 8 - all women with multiple gestation, including those with previous cesarean section (s)	11	3.74
Group 9 - all pregnant women with transverse or oblique position, including those with previous cesarean section (s)	3	1.02
Group 10 - all pregnant with single fetus and cephalic, <37 weeks, including those with previous cesarean section (s)	35	11.90
Total	**294**	**100.00**

There was a greater frequency of pregnant women in the age group of 16 to 25 years old, followed by the group of 26 to 34 years. These findings were similar to the research on the epidemiological profile of parturient submitted to cesarean section in Botucatu-SP[10], where the age range ranged from 19 to 36 years. Although there are no clear biological justifications for this, the hypothesis is that older women are subject to more comorbidities[11], which could contribute to the indication of cesarean sections. The maternal age is considered a risk factor for gestation. For the

Ministry of Health, pregnant women aged 35 years or older are considered late or old, being more susceptible to develop complications during pregnancy, which makes high-risk pregnancy[12].

Regarding the marital situation, most of the pregnant women were in a stable union, but a relatively high number was single. Still in the study in Botucatu-SP it was observed that the majority were married, followed by single.[10] Anyone who has had the experience of gestation or even followed closely, can easily prove that regardless of family configuration, this period brings up a series of emotions and decisions that impact the daily lives of the already formed or future families, thus, several countries that develop studies and research applied to this theme, emphasize the importance and positive results of the active engagement of men throughout this process of gestation, section and puerperium. Stimulating father/partner participation throughout this process may be critical to the biopsychosocial well-being of the mother, the baby, and himself[13].

Regarding education level, most of the patients had completed high school, as found in the study that analyzes the sociodemographic and epidemiological characterization of cesareans in a public maternity hospital in Teresina[14]. However, this data is more significant when the pregnant woman is investigated as to the preference of the way of childbirth, which is not the case in this study. Women who use the private health sector, who hypothetically would have better access to quality information and services, are the ones that most undergo surgery[15].

There was a prevalence of nulliparous women undergoing cesarean section. High rates of cesarean sections in primiparous women are particularly worrying because they imply high probability of future cesarean sections, since, in practice, a previous cesarean section is an almost absolute indication for a new cesarean section[16].

The multiparas with previous cesarean section in this study also contributed to the high cesarean rate. The first cesarean section contributes a large number of procedures to the overall rate. The cesarean section indicated by iterativity, that is, by the presence of a previous uterine scar, helps very significantly in the increase of the global cesarean rates. In the United States, one third of all cesarean sections are performed in patients with previous cesarean section[17]. Previous cesarean sections have been identified as a maintenance factor of the high rates of this surgery in developed countries. Reinforcing this issue, in a study carried out, women with previous vaginal section have a smaller chance (around 25 times) of opting for cesarean section. The vaginal section after cesarean section, when compared to the routine cesarean section indicated by iterativity, presents favorable results[18]. A systematic review with a study of 203 studies showed that maternal mortality increased significantly with repetitive cesarean sections, comparing these data with the results of vaginal birth after cesarean section[19].

The high rate of cesarean section prior to labor, full term pregnancies (39 weeks to 40 weeks and 6 days) and the initial term pregnancies (37 weeks to 38 weeks and 6 days) were the most prevalent, which contrasted with another study with a high percentage (30%) of pregnant women of preterm age[10]. The high prevalence of caesarean sections prior to labor and early caesarean birth rates are worrying because caesarean sections before 39 weeks increase the risk of neonatal morbidity[20] and negative long-term outcomes, such as lower scores on reading and math tests in childhood compared to children born after 39 weeks of gestation[21].

In over 90% of cesarean sections, cephalic presentation occurred, which would help to make vaginal section possible. However, changes in the cephalic presentation may be indicative of cesarean sections when, for example, there are flaws in the dystocia correction maneuvers, signs of obstructed labor or fetal hypoxemia.[22] In this study, the reasons for which the obstetrical team opted for childbirth via cesarean were not recorded, however, an exaggerated incidence of cesarean deliveries is undeniable, which leads to a reflection on the real need for this procedure.

Regarding the number of fetuses, although most pregnancies submitted to cesarean section were single-fetus, recent studies indicate that, in the case of multiple pregnancies, perinatal outcomes are not improved by cesarean section, when the first twin is in cephalic position. Thus, women who have twins in a cephalic/cephalic or cephalic/non-cephalic should be advised to attempt vaginal section[23].

In most studies in which the Robson Classification was adopted, cesarean was more frequent in groups 5 (all multiparous with at least one previous cesarean section, single fetus, cephalic ≥ 37 weeks), and 2 (nulliparas, single fetus, cephalic, ≥ 37 weeks, whose childbirth is induced or who undergo cesarean section prior to labor),[24,25] as in this study. Group 5 is composed of multiparas with at least one previous cesarean section, which reinforces that previous cesarean section raises the indication of operative childbirth in future pregnancies. By contrast, when comparing group 5 with other similar groups of women (multiparous) but without previous uterine scarring, such as groups 3 (multiparous without previous cesarean section, single fetus, cephalic, ≥ 37 weeks in spontaneous labor) and 4 (multiparous women without previous cesarean section, single fetus, cephalic, ≥ 37 weeks, whose delivery is induced or who undergo cesarean section before labor begins), it can be inferred that having a previous vaginal childbirth decreases the chances of cesarean delivery in subsequent pregnancies[25].

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In addition, there was a high rate of cesarean section in women without previous uterine scarring, with induced labor or cesarean section prior to labor (group 2), showing the need to review current indications and forms of labor induction as well as the actual indications of cesarean section in these women[25].

CONCLUSION

It was concluded by this study that the hospital has a high rate of cesarean section, even if it is a study carried out in a reference maternity hospital for high-risk pregnant women. The majority of patients submitted to cesarean section were nulliparous, followed by those of multiparas with previous cesarean section, which reinforces the importance of cesarean section prevention in primiparous, in order to avoid indications in future pregnancies.

It is also emphasized the importance of using the Robson Classification as an instrument to know the profile of the users through obstetric characteristics, as well as to collaborate in the monitoring, planning and decision making of the team.

The limitations of the present study are related to the scarcity of material published on the topic addressed to the Robson Classification, to the inconsistencies in numbers of certain medical records and to the quality of information in them.

It is highlighted the relevance of this issue and the need for other researches to clarify the different factors influencing the choice of childbirth in order to reduce cesarean rates and to promote quality care with the minimum of possible interventions in the binomial mother-baby.

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