Cesarean section on demand: a population-based study in Southern Brazil

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Abstract

Objectives: to measure the prevalence and identify factors associated to the occurrence of cesarean section on demand in the municipality of Rio Grande, RS.

Methods: all births that occurred in the two maternities between 01/01 to 12/31/2007, mothers who lived in the municipality were questioned on demographic and maternal reproductive characteristics, family socioeconomic level and health care received during pregnancy and childbirth. The outcome was constituted by cesarean section on demand, in other words, the request was from the parturient. In the analysis, Poisson regression was used with robust adjustment of the variance. The effect measurement used was the prevalence ratios (PR).

Results: among the 2,557 parturients included in this study, 51.6% (CI95%:49.6%-53.5%) were submitted to cesarean sections, and 10.7% (CI95%:9.0%-12.4%) were on demand. After the adjustment based on previous hierarchical model, the variables showed significantly the association to the outcomes which were maternal schooling, household income, type of hospitalization (public or private) and being attended by the same physician throughout the prenatal period.

Conclusions: the PR obtained show that the probability of occurrence of cesarean section on demand was substantially higher among the mothers who presented the lowest risk of complications during pregnancy and childbirth.

Key words *Women's health, Prenatal care, Childbirth, Cesarean section*

Introduction

The search for safety led to the institutionalization and consequently medicalization of childbirth. This meant that the cesarean section, taken initially as a universal solution to obstetric problems, became one of the procedures most commonly performed.[1]

In Brazil, in addition to occupy a world leadership in the occurrence of cesarean section, this method became the most common method for babies to be born.[2] The indiscriminate use of cesarean sections has very little to do with clinical needs for pregnant woman and/or the newborn, but it has to do with the will of the mother, the physician and the socioeconomic level of the family.[3,4] As a rule, this procedure is performed among those with lower risk of complications during pregnancy and childbirth.[5]

Within this abusive practice, there are significant proportion of women in a deliberated and assumed way asking the obstetrician to perform a cesarean section, regardless of their actual need. Hence the title "cesarean section on demanad".[6] The main reason why they claim for this is to avoid pain, laceration or tokophobia, which refers to the irrational fear of vaginal delivery.[1]

The occurrence of this type of cesarean section without medical indication has been increasing throughout the world, and this violates the principles of good medical practice, submitting the patient to unnecessary risks and increasing the expense in the health sector.[7] Between 6% and 17% of cesarean sections in different countries occur by maternal demand.[1]

In Brazil, the cesarean section on demand has been little studied. There is no population-based study found which addresses this issue. This may be due to that the subject is not yet seen as relevant, the decision about cesarean sections are assigned by the physician, or assuming that there is no difference of cesarean section as being a demand or not. In relation to the occurrence of cesarean sections in the country, there is consensus that are carried out a lot, especially among those who present the lowest risk of complications during childbirth.[5,7-9]

The aim of this study was to measure the prevalence and identify factors associated to the occurrence of cesarean section on demand between mothers who had children in 2007 in the municipality of Rio Grande, RS.

Methods

The municipality of Rio Grande is located in the Southern part in Brazil and in 2007, when this study was conducted there were about 200 thousand inhabitants. Its economy was based on agriculture and in port activity. The public health sector counts on two general hospitals, three specialized medical outpatient clinics and 32 basic health units. The infant mortality rate was 15/1000.10

This study included all births that occurred between 01/01 to 12/31/ 2007 in the only two maternity hospitals in the city: Santa Casa de Misericordia Hospital and Universidade Federal do Rio Grande (FURG) Hospital. To take part in this study, the newborn should weigh equally to or more than 500 grams and/or at least was 20 weeks of gestational age. Fulfilling these requirements, their mothers were interviewed.

The design used was the cross-sectional type, interviewing the mothers only once at the maternity, preferably in the first 24 hours after the delivery. This interview was done using a standardized questionnaire that sought information about demographic characteristics, occupation, reproductive history and the mother's life habits; socioeconomic status, ownership of household appliances and housing conditions and family sanitation, healthcare received during pregnancy and childbirth and access, utilization of preventive and health curative services. The outcome, measured from the mother's report, was constituted by the occurrence of cesarean section on demand, or in other words, the cesarean section was performed in the service based on the solicitation.

Ten interviewers were trained during five consecutive days. Eight of them were medical students and the others were undergraduates in social work. The training included reading the questionnaire, manual instructions and interview simulations. The study pilot was carried out at the same maternity units in the prior month of the data collecting.

These two maternity hospitals were visited by the interviewers daily. The identification of the parturient was performed on visiting the wards and by confirming the birth registration book. If they resided in the municipality of Rio Grande and agreed to participate, the parturient would sign the informed consent form.

The undergraduate interviewers collected the data on working days, while the students worked always in pairs on the weekends and on holidays. At the end of every working day, each interviewer codified the questionnaires and turned them in at the headquarters of the project. Fortnightly, the team would meet with the coordinator of the study (JAC). The questionnaires were doubly entered in reverse

order by different professionals. Every two weeks, these entries were compared and eventual errors were listed and corrected. Then, the consistency of the data was verified with immediate correction. The data entry was performed using Epi Info 6.04.,[11] while the consistency analysis, which included the categorization of variables and verification of frequencies, was carried out using the statistical package, Stata version 11.0.[12]

Approximately 10% of interviews were redone in order to evaluate the quality of the data collected. This was done later over the phone or visiting. On this occasion, an abbreviated questionnaire was applied. The *kappa* index on the agreement ranged from 0.68 to 0.89.

The crude and adjusted analysis were performed using Poisson regression with robust adjustment for the variance.[13] The results were expressed by the measurement of the prevalence ratios (PR), a confidence interval of 95% (CI95%) and *p* value of Wald test for heterogeneity. The adjusted analysis was performed based on a hierarchical model previously defined with four levels.[14] These levels had to determine the order of the variables entry in the model. In the first level were included the demographic and socioeconomic variables (age, skin color, living with a partner, schooling and household income); in the second level the variables were related to prenatal care (type and the number of prenatal consultations, type of hospitalization, if the patient was attended by the same physician throughout the prenatal care); in the third level were the reproductive variables (parity and birth weight) and in the fourth level was morbidity during pregnancy. The outcome was constituted by cesarean sections on demand. All variables were taken to the multivariate model kept in the value of $p \leq 0.20$. The analysis were conducted by using Stata 11.0 program and the significance level used was of 95%.

The research protocol was submitted and approved by the Committee of Ethics in Research in the Health Area (CEPAS) at the Universidade Federal do Rio Grande (FURG), Process number: 23116.5369/6.58 – Report number: 012/2007. Moreover, it was assured the confidentiality of data, voluntary participation and the possibility to leave the study at any time without the need to justify.

Results

Among the 2,557 women studied, 1,319 (51.6%) were submitted to cesarean section, this is the denominator of this study. The losses amounted to 1.2%.

The description of the sample in relation to demographic, socioeconomic, gestational and reproductive characteristics is shown in Table 1. Of all the mothers, just over 15% (15.6%) of the mothers submitted to cesarean sections were adolescents, 74.7% were white, 86.9% lived with a partner, 37.0% had up to eight years of schooling and the family monthly income was less than two minimum wages (MW). About two-thirds of the mothers (64.8%) had prenatal care at a public health services, 82.3% had completed six or more visitations throughout the prenatal care and were attended by the same physician throughout the pregnancy. Among all of them, 42.4% were primiparous, 30.1% had children born weighing equally or greater than 3,500 grams, 26.4% of the mothers reported some kind of disease during the gestational period and 10.7% performed a cesarean section on demand. In the same Table 1, it is possible to verify that the prevalence of the cesarean section on demand was substantially higher among mothers with higher schooling level and household income, who underwent prenatal care in the private sector, who have completed six or more consultations and were attended by the same physician throughout the prenatal period.

Table 2 shows that the occurrence of cesarean section on demand ranged from 2.1% among those treated by different physicians during the prenatal care and up to 30.7% among the mothers who were attended by a private physician at the time of the delivery. In the crude analysis were significantly associated to a cesarean section on demand as the following variables: skin color and maternal schooling, household income, prenatal in public or private hospital, number of consultations, types of hospitalization at delivery and attended by the same physician throughout the prenatal care, parity and occurrence of disease during the gestational period. While adjusting the analysis, it remained significantly associated to the outcome of the variables on maternal schooling, household income, types of hospitalization during childbirth and performed all the prenatal care with the same physician and reports of morbidity during pregnancy.

Discussion

According to the mothers' reports, at least one in every ten cesarean sections that occurred in the municipality of Rio Grande in 2007 was performed by the mother's demand. The factors significantly associated to this practice were high schooling and

Table 1

Maternal demographic characteristics, family socioeconomic status and health care received during pregnancy and childbirth. Rio Grande, RS, 2007 (N=1319).

Characteristics	Cesarean section on demand				Total		*p*
	Yes		No				
	n	%	n	%	n	%	
Maternal age (years)							0.105
15-19	152	11.5	212	16.1	206	15.6	
20-29	769	58.3	702	53.2	708	53.7	
≥ 30	398	30.2	398	30.7	405	30.7	
Skin color							0.025
White	1111	84.2	971	73.6	981	74.7	
Mixed	133	10.1	214	16.2	204	15.5	
Black	77	5.8	135	10.2	128	9.7	
Living with a partner	1186	89.9	1141	86.5	1146	86.9	0.257
Maternal schooling (years)							<0.001
0-8	208	15.8	522	39.6	488	37.0	
9 -11	769	58.3	620	47.0	636	48.2	
≥ 12	342	25.9	177	13.4	195	14.8	
Household income (minimum wage)							>0.001
Up to 1.9	170	12.9	522	39.6	485	36.8	
2.0-3.9	427	32.4	488	37.0	481	36.5	
≥ 4.0	721	54.7	309	23.4	352	26.7	
Type of prenatal care performed							<0.001
Public	303	23.0	922	69.9	855	64.8	
Private	1016	77.0	397	30.1	464	35.2	
Performed six or more consultations throughout the prenatal care period	1281	97.1	1062	80.5	1086	82.3	<0.001
Mothers who were attended by the same physician throughout the prenatal care period	1262	95.7	993	75.3	1022	77.5	<0.001
Parity							0.005
1	645	48.9	549	41.6	559	42.4	
2	522	39.6	459	34.8	466	35.3	
≥ 3	152	11.5	311	23.6	294	22.3	
Birth weight (grams)							0.012
< 2,500	18	1.4	113	8.6	103	7.8	
2,500-2,999	294	22.3	276	20.9	277	21.0	
3,000-3,499	645	48.9	530	40.2	542	41.1	
≥ 3,500	360	27.3	400	30.3	397	30.1	
Referred in doing treatment for hypertension, diabetes and/or depression during prenatal care	218	16.5	364	27.6	348	26.4	0.005

Table 2

Crude and adjusted analysis for factors associated to the occurrence of cesarean section on demand. Rio Grande, RS, 2007 (N=1319).

Level	Characteristics	Prevalence of cesarean section on demand		Crude analysis	Adjusted analysis
		n	%	PR (CI95%)	PR (CI95%)
I	Maternal age (years)			*p*=0.11	*p*=0.60
	15-19	348	7.9	1.00	1.00
	20-24	121	9.2	1.16 (0.65 - 2.08)	0.80 (0.46 - 1.41)
	25-29	182	13.8	1.75 (1.02 - 2.98)	0.98 (0.57 - 1.67)
	≥ 30	140	10.6	1.34 (0.77 - 2.32)	0.67 (0.38 - 1.15)
	Skin color			*p*=0.01	*p*=0.09
	White	161	12.1	1.80 (1.16 - 2.79)	1.46 (0.95 - 2.26)
	Mixed/Black	88	6.7	1.00	1.00
	Lives with a partner			*p*=0.27	*p*=0.63
	No	108	8.2	1.00	1.00
	Yes	146	11.1	1.35 (0.80 - 2.29)	1.14 (0.67 - 1.92)
	Maternal schooling (years)			*p*<0.001	*p*=0.02
	0 to 8	61	4.6	1.00	1.00
	9 to 11	171	13.0	2.83 (1.79 - 4.46)	1.92 (1.21 - 3.05)
	≥ 12	249	18.9	4.10 (2.48 - 6.79)	1.70 (0.99 - 2.92)
	Household income (minimum wage)			*p*<0.001	*p*<0.001
	Up to 1.9	50	3.8	1.00	1.00
	2.0 to 3.9	125	9.5	2.52 (1.48 - 4.29)	2.06 (1.19 - 3.54)
	≥ 4.0	290	22.0	5.81 (3.54 - 9.53)	4.39 2.58 - 7.45)
II	Type of prenatal care			*p*<0.001	*p*=0.18
	Public	42	3.2	1.00	1.00
	Private	239	18.1	5.61 (3.54 - 8.89)	1.57 (0.81 - 3.05)
	Number of prenatal care consulation visits			*p*<0.001	*p*=0.30
	< 9	102	7.7	1.00	1.00
	≥ 9	186	14.1	1.83 (1.32 - 2.53)	0.84 (0.59 - 1.17)
	Type of hospitalization			*p*<0.001	*p*<0.001
	Public (SUS)	50	3.8	1.00	1.00
	Affiliated	278	21.1	8.05 (5.20 - 12.5)	2.84 (1.63 - 4.97)
	Private	405	30.7	5.54 (3.72 - 8.23)	3.88 (2.17 - 6.92)
	The same physician during prenatal care			*p*<0.001	*p*=0.01
	No	28	2.1	1.00	1.00
	Yes	177	13.4	6.44 (2.87 - 14.4)	2.93 (1.28 - 6.72)
III	Parity			*p*=0.01	*p*=0.65
	None	164	12.4	2.23 (1.32 - 3.77)	1.22 (0.72 - 2.09)
	One to two	158	12.0	2.17 (1.27 - 3.71)	1.29 (0.76 - 2.20)
	Three or more	74	5.6	1.00	1.00
	Birth weight (grams)			*p*=0.13	*p*=0.53
	Up to 2,999	117	8.9	1.00	1.00
	3,000 to 3,499	169	12.8	1.45 (0.97 - 2.14)	1.23 (0.85 - 1.79)
	≥ 3,500	129	9.8	1.11 (0.71 - 1.73)	1.22 (0.80 - 1.87)
IV	Morbidity during pregnancy			*p*=0.01	*p*=0.05
	No	161	12.2	1.00	1.00
	Yes	88	6.7	0.55 (0.36 - 0.85)	0.65 (0.43 - 1.00)

household income, performed prenatal care in the private hospital sector, have been attended by the same physician throughout the prenatal care and did not refer comorbidity in the gestational period.

There are few studies on this subject. In Brazil we were unable to find at least one population-based study addressing this issue. This became difficult to compare the results. It is still worth noting that the definition of the outcome was based solely and exclusively on the mother's report, without considering the physician's evaluation. So, we could say that these women did not have indications for a cesarean section, but they said they had made this demand to the obstetrician and they were attended.

The prevalence of 10.7% of cesarean section on demand is similar to that observed in other countries. In the United Kingdom and in the North of Europe the prevalence varies from 6% to 8%, in the United States 11.2%, while in Australia 17.2%.[1] In Rio Grande, only the cesarean sections performed on demand would represent at least one third of the rate recommended by the World Health Organization (WHO). This reinforces, once again, the urgent need to implement policies that are more compelling to combat the abusive practice of cesarean sections in Brazil.[5]

This present study showed that the mothers with high probability of performing cesarean sections on demand have higher schooling and household income. The PR in demanding cesarean sections among the mothers with eight or more years of schooling was at least 70% higher than the others. In the case of household income, these differences were even more evident. Mothers with household income ≥4.0 MW presented PR=4.39 (CI95%: 2.58-7.45) to perform a cesarean section on demand in comparison to those with incomes less than 2 MW. These two variables have been identified as the main determinants of performing cesarean sections in Brazil. This is due to the greater power of the families, women's empowerment and the right to choose, the freedom to mediate their health and have access to new technologies, in case of the cesarean section, which according to them means better health care.[5,15-17]

To perform all prenatal consultations with the same physician showed PR=2.93 (CI95%: 1.28-6.72) for the occurrence of cesarean section on demand in relation to mothers attended by two or more physicians in the prenatal care. To maintain this relationship during prenatal care, must be related to, in particular, the needs and the desire of the mother in performing cesarean sections. Soon, not opposing on the behalf of the physicians but could be contributing for this relation to be maintained. Qualitative studies could help understand this finding.

The PR solicit cesarean section on demand among the mothers who were hospitalized in a private or affiliated form were at least three times higher compared to those hospitalized in the Brazilian Public Health Care System (SUS). The hospitalization for childbirth in the private sector is part of a process that reveals the acquisition power of the households.[5] This process begins with the prenatal care consultations, passes by hospitalization and culminates with the payment for the obstetrician. There are numerous studies conducted in Brazil showing that these pregnant women are the ones that present the lowest need to be submitted to cesarean section.[5,16,17]

In this study, the presence of comorbidity in the gestational period decreases the probability performing a cesarean section on demand. Mothers who referred in receiving treatment for hypertension, diabetes and/or depression presented PR=0.65 (CI95%: 0.43-1.00), indicating that the presence of these pathologies decreases the probability of cesarean section on demand. This result needs to be seen with caution, whether it is by the borderline value of the confidence interval observed or the absence of a qualitative approach, in which could help in the explanation.

Performing cesarean sections in Brazil is, in general, a epidemic procedure which affects, especially mothers who presented the lowest risks of complications during pregnancy and at childbirth.[5,15-17] The results presented in this study show that, even among those who performed cesarean sections, know it is of lower risk, there is a group of lower risk, even if the women are submitted to a cesarean section on demand. This shows the necessity for strategies to inhibit this practice. The recent deployment of a term that requires the signature of the mother for a cesarean section may become difficult, but will not inhibit this practice.

Finally, it should be ensured that women have the right to choose, preserving the well-being of the newborn and, at the same time, advance in researching powerful themes such as, cohort studies and case and controls, in addition to qualitative studies. By performing this, it will improve the understanding of such complex subject as relevant and highly related to morbimortality and maternal and child health.

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