

# Factors associated with unjustified Cesarean section in four hospitals in Cali, Colombia

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## Abstract

**Objective.** To describe the factors associated with unjustified Cesarean section.

**Design.** Cross-sectional study.

**Setting.** Four hospitals providing obstetric services, two that serve patients insured through their employer (contributive regimen) and two that serve privately insured patients, in Cali, Colombia.

**Study participants.** Four hundred and sixteen patients with Cesarean section performed in 1996 because of previous Cesarean section, dystocia, acute fetal distress, breech presentation and maternal choice. Patients with toxemia, diabetes, hypertension and other related diseases were excluded.

**Main outcome measures.** Unjustified Cesarean section.

**Results.** Of primary Cesarean sections 81.2% were unjustified. Dystocia was the indication given for unjustified surgeries in 78% of cases. Hospital No. 2 had the highest proportion of unjustified procedures compared to the other three institutions. Patients for whom the procedure had been decided before prelabor and on whom it was performed between 7:00 a.m. and 5:59 p.m. had higher proportions of unjustified procedures.

**Keywords:** Cesarean section, Colombia, health reform, intervention use, quality of health care

In recent years there has been an unjustified increase in the numbers of certain medical procedures such as hysterectomy [1], cataract surgery [2], cholecystectomy [3], psychiatric services [4] and Cesarean deliveries [5–10]. In the case of Cesarean section, this increase has been attributed to the type of practice of the obstetricians, their work schedules, financial incentives to doctors and hospitals and the insurance status of the patient [5–10]. In the USA, privately insured patients have significantly higher Cesarean section rates than those affiliated with HMOs [9].

In 1993, the Colombian Congress passed a law introducing reforms into the organization, financing and delivery of health services in the country, and establishing the General System of Health and Social Security (Sistema General de Seguridad Social en Salud; SGSSS).

The SGSSS is an employee-based mandatory insurance system. Individuals must pay 12% of their income to a 'Solidarity Fund' managed by the Ministry of Health. For

those permanently employed, the employer pays two-thirds of that amount and the other third comes out of their earnings. The self-employed must pay the entire 12% of their earnings. In return, enrollees obtain coverage for themselves and their families and a package of health benefits: the 'Mandatory Health Plan' (Plan Obligatorio de Salud). Intermediary institutions, the 'Health Promotion Entities' (Entidad Promotora de Salud; EPS) act as tax collectors on behalf of the solidarity fund, and manage the health plan benefits. To achieve this, each EPS establishes a network of providers and becomes guarantor of the provision of all services included in the package. Those who wish to have additional services may subscribe to the 'Complementary Plan' to the EPS or to private insurance agencies. Poor and unemployed are enrolled in the 'Subsidized Regimen' (Régimen Subsidiado) paid for by the government [11].

To describe the factors associated with unjustified Cesarean section, in Cali, Colombia, a study was carried out in four

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hospitals, two serving women insured through the contributive regimen and two serving privately insured women.

## Methods

### Study design

A cross-sectional study was carried out in four hospitals that provide obstetrical care in Cali, Colombia.

### Selection process

Cali, the second largest city of Colombia, has a population of approximately two million. The health sector is organized by levels of care. Tertiary care is provided mainly by two governmental institutions: the University Hospital and the Social Security Clinic. These institutions were not included in the study because of the level of complexity. Six out of the 10 second-level hospitals providing maternal care were invited to participate. The four excluded did not have adequate quality control of clinical records according to officers from a government agency. Of the six invited, two did not accept.

The number of births in 1996 differed among the four institutions in the study. In three of them all clinical records of patients with Cesarean section were reviewed for admissibility criteria and those fulfilling these criteria were included in the study. In the remaining hospital, from the 2105 clinical records of patients with Cesarean section a simple random sample was taken, based on a 10% prevalence of unjustified Cesarean section, a 95% significance level and a study power of 80%. This resulted in 184 cases selected. However this number was doubled on the assumption that only 50% would demonstrate the admissibility criteria.

### Admissibility criteria

Women with full term pregnancies (37 to 42 weeks); Cesarean Section indicated for the following reasons: previous Cesarean section, dystocia, acute fetal distress diagnosed through fetal monitoring, breech presentation, and maternal choice.

Patients with any disease, such as toxemia, urinary tract infections, diabetes or hypertension were not included in the study, nor were patients transferred from other institutions.

### Variables and indicators

In the four hospitals, it was established through interview whether there had been non-clinical factors leading to Cesarean sections (for instance, increasing the profits because of use of surgical facilities, charging for lengthier stays than those of normal deliveries) and whether the doctors (obstetricians or general practitioners) had incentives to perform Cesarean section (for example, less time spent in comparison to vaginal deliveries and, therefore, more time available to see other patients, or practices to avoid being sued).

The outcome variable was unjustified Cesarean section. Repeat Cesarean section was defined as all women with a previous Cesarean section to whom a new Cesarean section was made at the moment of delivery. Whether the Cesarean

section was justified or not could not be assessed for two main reasons: first, vaginal birth after Cesarean section (VBAC) needs some structural features [12] that two of the hospitals in the study did not have, and, second, in Colombia, VBAC is not usually recommended. Thus, repeat Cesarean sections were not taken into account for the analysis.

For the primary Cesarean section the classification of justified/unjustified intervention was defined according to criteria established by several authors [13–17]. Although maternal request should not always be defined as an unjustifiable reason for Cesarean section, in this study maternal choice was considered unjustified because, apart from maternal request, no medical cause was identified in the clinical records. Acute fetal distress was determined by the independent assessment of fetal monitoring records by two qualified obstetricians. If agreement over fetal distress could not be reached, the patient was excluded from the study. Breech presentation was accepted as an indication for Cesarean section if confirmed by ultrasound diagnosis after 37 weeks of pregnancy or by vaginal examination during labor. Dystocia was diagnosed when there was no progress of labor for more than 2 hours of regular and intense uterine contractions and no response to oxytocin or amniotomy. Dystocia was also diagnosed for maternal height less than 147 cm or fetal weight greater than 4000 grams according to ultrasound measures.

Other variables included were: (i) whether the Cesarean section was carried out during prelabor (elective) as opposed to those performed during active phases of labor (intrapartum); (ii) the indication for the procedure; (iii) demographic variables (age, occupation, marital status); and (iv) time variables (day of the week and hour of the procedure).

### Data collection

Data were collected from the clinical records of the patients included in the study and recorded onto a questionnaire designed and tested previously. Confidentiality was assured, and only the numbers of the clinical records were written down. In addition, to keep the identities of the institutions unknown, each was assigned a number. All data were collected between April 1997 and August 1997 by a physician trained in public health (O.L.G.).

### Data analysis

Data were entered into an EXCEL [18] database and then exported to STATA 3.1 [19] for statistical analysis. The proportion of unjustified Cesarean section was calculated and bivariate analysis was carried out in order to describe the traits of these unjustified procedures.

## Results

A total of 416 patients were included from the four hospitals studied. Two main categories were defined; two hospitals provided services for privately insured patients (133 in hospital 1 and 67 in hospital 2) and the other two for the mandatory

**Table 1** Indications for Cesarean section by hospital. Cali, Colombia, 1997

	Repeat section		Dystocia		Breech presentation		Acute fetal distress		Maternal choice		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Hospital 1	74	55.6	35	26.3	10	7.5	3	2.2	11	8.3	133	100.0
Hospital 2	34	50.7	28	41.8	3	4.5	2	3.0	0	0.0	67	100.0
Hospital 3	63	31.6	111	55.8	23	11.6	1	0.5	1	0.5	199	100.0
Hospital 4	7	41.2	7	41.2	2	11.7	1	5.9	0	0.0	17	100.0
Total	178	42.8	181	43.5	38	9.1	7	1.7	12	2.9	416	100.0

health plan (199 in hospital 3 and 17 in hospital 4). In one of the privately insured plans non-clinical factors leading to Cesarean section were identified. In the interview the manager of the hospital acknowledged being aware that patients with Cesarean section would increase the occupancy rate as well as the use of operating rooms.

The finding of 160 (72%) cesarean sections out of a total of 223 births in hospital 2 was similar to the 68% of overall Cesarean section rates for those in hospital 1. However, privately insured patients had higher Cesarean section rates than those in the mandatory health plan: hospital 4 (42%) and hospital 3 (42%).

Table 1 shows the distribution of indications for Cesarean section by hospital. Hospital 1 and hospital 2 have a significantly greater proportion of repeat Cesarean sections than those receiving services under the mandatory health plan (hospital 3 and hospital 4) when repeat Cesarean section is compared with all other reasons combined ( $\chi^2=21.52$ ;  $P=0.000$ ).

In 229 (96.2%) out of the 238 patients with a primary Cesarean section, a reason for the justified/unjustified surgery was found. Therefore, the remaining nine patients (eight with dystocia and one with acute fetal distress) were excluded from the analysis.

Of 229 primary Cesarean sections 186 (81.2%) were unjustified according to the study criteria: 145 (83.8%) patients with diagnosis of dystocia, 24 (63.2%) with breech presentation and five (83.3%) with acute fetal distress did not fit the criteria of justified Cesarean section. All cases of maternal choice were considered as unjustified.

Despite the small number of women, there was a statistically significant lower proportion of unjustified Cesarean section in the patients receiving services in hospital 4 as compared with any of the other three institutions. No differences were found among the other three hospitals (Table 2).

Of the 229 patients with primary Cesarean section 167 (72.9%) had elective surgery as compared with 62 (27.1%) in which the decision was taken intrapartum. Hospital 4 had a significantly lower proportion (20.0%;  $P=0.000$ ) of elective Cesarean section as compared with hospital 1 (60.7%), hospital 2 (74.2%) and hospital 3 (81.8%). Primary Cesarean section was more frequently performed on Mondays (18%) and Fridays (24.4%) than on the other days of the week;

94.2% of these procedures occurred between 7:00 a.m. and 6:00 p.m.

Among patients whose Cesarean section was justified, there was no difference in the distribution among the six working days of the week ( $P=0.74$ ). However, the unjustified Cesarean sections were more frequently performed on Fridays than on other days of the week ( $P=0.016$ ).

There were no differences in the proportion of unjustified cesarean section by age, occupation and marital status. Patients on whom the procedure was carried out electively had a higher proportion of unjustified Cesarean sections. The same was true of Cesarean sections performed between 7:00 a.m. and 6:00 p.m. when compared with the rest of the day (Table 3). These differences were statistically significant.

## Discussion

The health sector requires proper assessment of services for sound policy making and adequate planning [20–23]. It is important to carry out studies which describe the appropriateness of common procedures. The increase in unjustified Cesarean section needs to be assessed before strategies to control this situation are designed. This study describes some characteristics associated with the appropriateness of Cesarean sections.

In the four hospitals studied the Cesarean section rates were higher than those accepted by international standards. However, it was found that those hospitals serving privately insured patients had a higher proportion of Cesarean section than those of the Mandatory Health Plan. A similar trend has been reported for the USA [9] and Italy [10] where private patients had a higher proportion of Cesarean sections than those patients served by the social security system.

The Cesarean section rate should be less than 15% [6]. Figures above this are considered unjustified procedures [5–10]. High rates in Cali may be due to the lack of clinical guidelines and absence of programs designed to lower Cesarean section rates, especially those justified because of previous Cesarean births, as has been suggested by other investigators [14,15].

Of the unjustified Cesarean sections 78% were due to

**Table 2** Proportions of unjustified cesarean section (95% CI) by Hospital, Cali, Colombia, 1997

	Justified Cesarean section			Unjustified Cesarean section		
	<i>n</i>	%	95% CI	<i>n</i>	%	95% CI
Hospital 1	14	25.0	14.8–38.6	42	75.0	61.4–85.2
Hospital 2	1	3.23	0.2–18.5	30	96.8	81.5–99.8
Hospital 3	21	15.9	10.3–23.5	111	84.1	76.5–98.7
Hospital 4	7	70.0	35.4–91.9	3	30.0	8.1–64.6
Total	43	18.8	14.1–24.6	186	81.2	75.43–85.94

**Table 3** Proportions of unjustified cesarean section (95% CI) by study variables, Cali, Colombia, 1997

Variables	Unjustified Cesarean section	
	%	95% CI
<20 years old	76.9	55.9–90.2
>20 years old	81.8	75.6–86.7
College educated women	75.5	75.6–83.4
Householders	80.8	71.2–88.0
Married women	81.5	73.7–87.4
Unmarried women	80.8	71.2–87.9
Elective	89.2	83.2–93.3
Intrapartum	59.7	46.4–71.7
7:00 a.m.–5:59 p.m.	83.5	77.6–88.1
6:00 p.m.–6:59 a.m.	38.5	15.1–67.7

dystocia. Other indications for Cesarean section such as breech presentation or acute fetal distress have more objective criteria in their diagnoses. This may be one of the main reasons for such a high proportion of unjustified Cesarean section as has been discussed by Sakala [5].

The highest proportion of unjustified Cesarean section occurred in hospital 2. Here both the hospital and the obstetrician had non-clinical reasons to perform surgery and also the patients were privately insured. In comparison hospital 4, with the lowest proportion of unjustified Cesarean sections did not report evidence of such reasons and the patients here were covered by the mandatory health plan.

The hour of the surgery and whether the procedure was elective or intrapartum showed differences in the proportion of unjustified Cesarean sections. These variables depend on the clinical features of each case, but may be influenced by factors such as the work schedules of the obstetricians and other doctors, and also by the working shifts of the hospitals [5]. Moreover this study found variations in the number of Cesarean sections according to day of the week; other researchers have also reported such variations and attributed them to certain working schedules [24].

The definition of unjustified Cesarean section could have been affected by a bias of the observer. This was avoided by determining clearly defined criteria on the pertinence of the Cesarean procedures before data collection was begun [25].

The increase in the use of Cesarean section is worrying due to the high costs and the morbidity associated with unjustified procedures. The mandatory health plan in Colombia was designed based on assumptions about the use of services. If the system has to deal with such an unexpectedly high Cesarean rate, it will not be able to support the package of services in the near future. Furthermore, within the framework of prepaid medical schemes, excessive use of procedures and technologies associated with them would produce inflation within the system [26].

This study provides reasons for creating strategies to lower the number of unjustified Cesarean sections in Colombia. Education of doctors and users of services, peer review, better clinical guidelines, external auditors, alternative means of payment for professionals and hospitals, and legislative reforms should all be considered [7].

For the implementation of quality assurance programs, more research on the quality of care is needed; this should take into account factors associated with the use of services and adverse results to the patients. Expenditure control and the financial stability of health systems are both the cause and result of the best quality of health care.

### Acknowledgements

This project was supported by FUNDACION CORONA of Colombia and the School of Public Health of University of Valle of Cali, Colombia. The authors thank the managers, physicians, officers and other employees of the four hospitals that participated in the study. The authors are also indebted to E. Cobo, chief of the Department of Obstetrics and Gynecology of Fundación Valle de Lili, Cali, Colombia, for his revision of many versions of the manuscript.

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Accepted for publication 9 July 1999