



Article

## Cesarean section as a cause of chronic pelvic pain

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### Abstract

**Objective:** To determine if the history of cesarean section was associated with chronic pelvic pain, independent of the presence of other conditions such as pelvic adhesions, endometriosis, sequelae of pelvic inflammatory disease, leiomyoma and pelvic varices. **Methods:** Retrospective case–control study conducted on 199 patients consecutively admitted from January 1998 to January 2000, 116 of them submitted to laparoscopy for the diagnosis of chronic pelvic pain and 83 asymptomatic patients submitted to tubal ligation by laparoscopy. A logistic regression analysis was used to verify the association between chronic pelvic pain and the history of previous cesarean section. **Results:** In women with chronic pelvic pain, a history of cesarean section was observed in 67.2% of cases, adhesions in 51.7%, endometriosis in 33.6%, sequelae of pelvic inflammatory disease in 31.9%, leiomyoma in 6.9% and pelvic varices in 11.2%. In asymptomatic women, a history of cesarean section was observed in 38.5%, adhesions in 24.1%, endometriosis in 9.6%, sequelae of pelvic inflammatory disease in 4.8%, leiomyoma in 7.2% and pelvic varices in 3.6%. In a logistic model, chronic pelvic pain was associated with a history of cesarean section (O.R. = 3.7), as well as with endometriosis (O.R. = 8.5), sequelae of pelvic inflammatory disease (O.R. = 10.5). **Conclusions:** In the present study cesarean section was associated with chronic pelvic pain. This fact may be the cause of a public health problem in the coming years, due to the raised rates of cesarean section in Brazilian women.

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**Keywords:** Chronic pelvic pain; Cesarean section; Laparoscopy

### 1. Introduction

Chronic pelvic pain is a common gynecological problem that affects millions of women worldwide. The condition is defined as non-cyclic pain in the lower abdominal portion present for at least 6 months [1], and commonly occurs in women

during their reproductive years, interfering with daily activities, relationships, and leisure. This condition represents significant costs to health services [2]. The physiopathology of chronic pelvic pain is not completely understood and treatment is limited to alleviate the symptoms, with generally unsatisfactory outcome. At present, laparoscopy has been accepted as the gold standard for the diagnostic investigation in patients with chronic pelvic pain. The diseases most commonly

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detected by this diagnostic procedure are endometriosis, intrapelvic adhesions and sequelae of pelvic inflammatory diseases [3].

To our knowledge, there are no reports regarding the association between the history of cesarean sections and of chronic pelvic pain. The increase in the frequency of this intervention especially in developing countries, with rates of up to 30% in the public sector and up to 70% in the private sector [4], becomes necessary to study its consequences in the future life of the women. The objective of the present study was to determine if the history of cesarean sections is associated with chronic pelvic pain independent of the presence of other potential cause such as endometriosis, pelvic adhesions, pelvic inflammatory disease sequelae, uterine fibroid or pelvic varices.

## 2. Patients and methods

A retrospective case–control study was conducted on 199 patients consecutively admitted between January 1998 and January 2000; 116 of them for the diagnosis of chronic pelvic pain and, 83 asymptomatic patients for surgical sterilization. For inclusion were considered cases the patients with non-cyclic pain in lower abdomen present for at least 6 months, and controls were patients with no pelvic or abdominal pain.

### 2.1. Preoperative evaluation

Detailed pain history (duration and characteristics), history of deliveries and complete abdominal and gynecological examination were obtained for all patients.

### 2.2. Surgical procedures

Before the therapeutic surgical procedures, the peritoneum of the abdominal wall, the hepatic surface, colon intestinal loops and rectum were submitted to systematic examination. Pelvic examination included the pelvic peritoneum, uterine and ovarian surface, and Douglas' cul-de-sac. The presence of pelvic adhesion, endometriosis, uterine leiomyoma, sequelae of pelvic inflammatory disease (hydrosalpinx, fimbrial distortion, fimbrial

agglutination, or perihepatic adhesion) were registered in a specific form.

The surgical interventions included endocoagulation of endometriotic implants, enucleation of endometriotic cysts, adhesiolysis and hysterectomy. Tubal ligation were performed using a Yon ring.

### 2.3. Statistical analysis

The results were submitted to logistic regression performed online (see webpage <http://members.aol.com/johnp71/logistic.html>). To estimate the probability of the occurrence of pelvic pain as a function of independent variables (a history of cesarean section, endometriosis, pelvic adhesions, sequelae of pelvic inflammatory disease, leiomyomas, and pelvic varices), values of 1 or 0 were used for the presence or absence of the variable, respectively.

## 3. Results

All patients included in this study were similar according to social level. The age of the patients ranged from 19 to 52 years (mean 34.3 years) in the pelvic pain group and from 22 to 47 years (mean 36 years) in the control group. The number of gestations ranged from 0 to 8 (median 2) in the pelvic pain group and from 1 to 12 (median 4) in the control group. Ninety-three (80%) patients in the pelvic pain group and 63 (76%) in the control group were white.

Surgical evaluation revealed a normal pelvis in 7 (6%) of the 116 patients with chronic pelvic pain included in the study. In this group, 78 (67.2%) patients had been submitted to previous cesarean section, 39 (33.6%) presented endometriosis, 60 (33.6%) pelvic adhesions, 37 (31.9%) sequelae of pelvic inflammatory disease, 8 (6.9%) leiomyomas, and 13 (11.2%) pelvic varices. Of the 83 asymptomatic patients hospitalized for tubal ligation, 52 (62.5%) presented normal pelvis, 31 (38.5%) had been submitted to previous cesarean section, 8 (9.6%) presented endometriosis, 19 (22.9%) pelvic adhesions, 4 (4.8%) sequelae of pelvic inflammatory disease, 6 (7.2%) leiomyomas, and 3 (3.6%) pelvic varices (Table 1).

Table 1  
Distributions of variables in patients with and without pelvic pain

Variable	Pelvic pain	Controls
Previous cesarean section	78 (67.2%)	32 (38.5%)
Pelvic adhesions	60 (51.7%)	19 (22.9%)
Endometriosis	39 (33.6%)	8 (9.6%)
Sequelae of PID	37 (31.9%)	4 (4.8%)
Leiomyoma	8 (6.9%)	6 (7.2%)
Pelvic varices	13 (11.2%)	3 (3.6%)
Normal pelvis	7 (6%)	52 (62.5%)

We verify using a logistic model that the history of cesarean section (O.R. = 3.7, 95% C.I. = 1.7–7.7;  $P=0.0006$ ), the presence of endometriosis (O.R. = 8.5, 95% C.I. = 3.4–21.4;  $P<0.00001$ ), and sequelae of pelvic inflammatory disease (O.R. = 10.5, 95% C.I. = 3.2–34.0;  $P=0.0001$ ) had presented independent association with chronic pelvic pain. However, we did not observe an association of pelvic pain with pelvic adhesions (O.R. = 1.7, 95% C.I. = 0.8–3.5;  $P=0.19$ ), leiomyomas (O.R. = 1.4, 95% C.I. = 0.4–5.2;  $P=0.57$ ), or pelvic varices (O.R. = 3.8, 95% C.I. = 0.9–15.8;  $P=0.07$ ) (Table 2).

#### 4. Discussion

Chronic pelvic pain is a debilitating condition associated with high rates of therapeutic failure, which significantly modify the quality of life of women, impairing marital life and reducing self-esteem, mainly during the reproductive age.

No consensus exists regarding the role and mechanisms of adhesions in chronic pelvic pain. This finding is generally associated with other diseases such as endometriosis, pelvic inflammatory disease and sequelae of previous abdominal surgical procedures. In the present study, laparoscopic examination revealed pelvic abnormalities in 109 (94%) of the 116 patients with chronic pelvic pain. Pelvic abnormalities were also observed for 31 (37%) of the 83 patients submitted to tubal ligation, who were completely asymptomatic. These findings are in agreements with the results of Kresh et al., who found abnormalities after laparoscopic procedures in 83% of patients with chronic pelvic pain and in 29% of asymptomatic

patients and concluded that pelvic abnormalities do not necessarily cause pain [5]. Some authors reported cases of spontaneous regression of endometriotic foci in asymptomatic women [6], however, adhesions secondary to endometriosis do not spontaneously regress and might be associated with the painful syndrome [7].

We observed a significantly higher incidence of cesarean sections in patients with chronic pain (67.2%) compared with the asymptomatic patients (38.5%). Possible causes of the painful syndrome in this condition are anatomic distortion of pelvic structures or adhesions involving bladder, round ligaments and adjacent structures, after suture and abnormal healing. Another possible cause is the occurrence of myofascial pain due to nerve bundle injury and formation of neuromas at the site of incision.

In women, pelvic pain can be caused by more than one factor. When clinical and surgical investigations are negative, other plausible explanation for the persistence of atypical pain exist, such as psychological components of the patient and co-factors, including the presence of depressive symptoms or a history of sexual trauma [8]. In our study 6.0% of patients with chronic pelvic pain had no identified cause.

In the present study, a positive association was observed between a history of cesarean section and chronic pelvic pain, independent of the association with other findings detected by diagnostic laparoscopy. This bad outcome must be considered by doctors before to perform a cesarean section without a usual medical indication.

Table 2  
Logistic regression of factors associated with pelvic pain in 199 patients

Variable	O.R.	95% C.I.	<i>P</i>
Previous cesarean section	3.7	1.7–7.7	0.0006
Pelvic adhesions	1.7	0.8–3.6	0.19
Sequelae of PID	10.5	3.3–34.0	0.0001
Endometriosis	8.5	3.4–21.4	<0.00001
Leiomyoma	1.4	0.4–5.0	0.57
Pelvic varices	3.8	0.9–15.8	0.07

**References**

- [1] Beard RW. Chronic pelvic pain. *Br J Obstet Gynaecol* 1998;105:8–10.
- [2] Zondervan KT, Yudkin PL, Vessey MP, Dawes MG, Barlow DH, Kennedy SH. The prevalence of chronic pelvic pain in women in the United Kingdom: a systematic review. *Br J Obstet Gynaecol* 1998;105:93–99.
- [3] Carter JE. Combined hysteroscopic and laparoscopic findings in patients with chronic pelvic pain. *J Am Assoc Gynecol Laparosc* 1994;2:43–47.
- [4] Potter JE, Berquo E, Perpetuo IH, Leal OF, Hopkins K, Souza MR, et al. Unwanted caesarean sections among public and private patients in Brazil: prospective study. *Br Med J* 2001;323:1155–1158.
- [5] Kresh AJ, Seifer D, Sachs L. Laparoscopy in 100 women with chronic pelvic pain. *Obstet Gynecol* 1984;64:672–674.
- [6] Koninckx PR, Meuleman C, Demeyere S, Lesaffre E, Cornillie FJ. Suggestive evidence that pelvic endometriosis is a progressive disease, whereas deeply infiltrating endometriosis is associated with pelvic pain. *Fertil Steril* 1991;55:759–765.
- [7] Carter JE. Chronic pelvic pain—diagnosis and management. [http://www.obgyn.net/carter/cpp\\_monograph/cpp\\_carter.htm](http://www.obgyn.net/carter/cpp_monograph/cpp_carter.htm)
- [8] Mathias SD, Kupperman M, Liberman RF, Lipschultz RC, Steege JF. Chronic pelvic pain: Prevalence, health-related quality of life, and economic correlates. *Obstet Gynecol* 1996;87:321–327.