

# Is C-section a risk factor for the early onset of irritable bowel syndrome?



GASTROENTEROLOGY

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## Abstract

**Background and aim.** There are controversial data in literature regarding the influence of abdominal and pelvic surgery on the onset of gastrointestinal symptoms. The aim of this study was to assess whether women who had a C-section (cesarean section) are more likely to develop irritable bowel syndrome (IBS) early after delivery than those who have given birth naturally.

**Method.** A cross-sectional study investigated women who had undergone C-section and were compared with a control group of women who had natural delivery. Data were obtained from Maternity Ward of Korce Hospital, in Albania. We conducted a telephone interview based on a questionnaire containing items to diagnose IBS based on the Rome IV criteria. The interviews were conducted 9 to 12 months after delivery.

**Results.** The prevalence of IBS in both groups taken together 4.6%. In the C-section group, prevalence of IBS was 4.3%, while in the control group it was 5.2%. All the patients with IBS had subtype with predominance of constipation. The RR 0.814 (CI 95%, 0.1423-4.66) does not confirm the hypothesis that C-section may induce early onset of IBS more often than natural birth.

**Conclusion.** The prevalence of IBS was (4.6%), within the known range of the Rome Foundation Global Study. Delivery by C-section does not have a role in developing IBS symptoms more than delivery by natural way in this group of Albanian women.

**Keywords:** irritable bowel syndrome, abdominal pain, pelvic surgery, C-section

## Introduction

As a highly prevalent condition (3% to 10%, in average 4%, irritable bowel syndrome has a major impact on health resources worldwide. [1,2]. IBS patients access more often health services, use more medication and have an impaired quality of life than the general population [3].

The most satisfying definition for IBS is that it is a gut-brain axis disorder. This is supported by the evidence of psychological conditions and psychiatric comorbidities in these patients [4].

The main mechanisms in IBS are visceral hypersensitivity and altered gut motility, and they reflect the symptoms of IBS: pain and intestinal transit alteration [5].

Abnormalities in brain – gut functioning can be triggered by sexual or physical abuse, life stress, anxiety, inflammatory events and abdominal or pelvic surgical interventions [6,7].

The relation between IBS and abdominal and pelvic surgery has been explored for many decades. Observations that IBS patients tend to have more surgical interventions than the general population are sustained by studies reporting OR=1.9 (95%, 1.2-3.2) for cholecystectomy and OR=1.6 (95%, 1.1-2.2) for hysterectomy obtained from previous studies [7].

It has also been hypothesized that IBS is a result of abdominal surgery [8,9].

A prospective study revealed that IBS and abdominal pain can be consequences of pelvic surgery

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(hysterectomy) - 2.7% in the surgical group developed IBS at 12 months compared with zero in the control group, but there are psychosocial factors that contribute to this effect. In this study, nerve trauma or inflammation were not predictive factors for further development of pain [6].

A more recent paper investigated if there was a connection between cesarean section and symptoms of IBS and concluded that women who had had a C-section had subsequently developed IBS, with mild symptoms [10].

The association between C-section and gastrointestinal symptoms and pain was investigated only by few papers. One study of this type compared the incidence of persistent pain in a group of patients who had cesarean delivery and in a control group who had vaginal delivery. The results were that persistent pain at 1 year after giving birth was higher after C-section than after vaginal delivery (22% vs. 8%) [11].

Surgical interventions have a stressful effect through both organic visceral trauma and the psychological effect on the patient. Stress expression in this case may have some effect on gut microbiota and may interfere with the good functioning of the gut-grain axis and this may be the origin of IBS symptoms these patients experience after the surgery [12,13].

One of the better explored relationships between surgery and post-operative digestive symptoms are hysterectomy vs. constipation, incontinence, IBS. The results are inconclusive, though a prospective study concluded that hysterectomy was not associated with de novo constipation or aggravation of it, if preexistent, but an increased risk for stool incontinence was observed [14].

Data on IBS have some geographical differences [1]. Data from Albania were absent, except our recent paper reporting a prevalence of 8.6% [15], thus higher than the average reported by the Rome Global Study [1]. Given this particularity, we looked for relationship between IBS and C-section in an area where there are few relevant data available.

### **Aim**

We aimed to determine if C-section is a risk factor for early onset IBS compared to natural delivery. We also wanted to evaluate the association between the type of delivery and developing of constipation and abdominal pain after giving birth.

### **Study protocol**

We carried out a cross-sectional study in a sample of Albanian women. Subjects were identified in a data base of women who delivered by C-section and compared with a group of women who delivered naturally. The database belonged to a regional hospital (Korce Regional Hospital)

and we accessed every woman who gave birth between January and June 2020. The participants from both groups were interviewed by telephone. The interview was based on a questionnaire that contained items for IBS diagnosis, according to the Rome IV criteria [5] regarding pain and transit alteration with post-delivery onset, previous surgery and bothersome changes in gut functioning after giving birth. Demographic data such as age and living area were also obtained. The interview took 10 minutes to be completed.

The questionnaire is displayed in Annex 1.

The subjects were informed that this was a follow-up on their gut health issues after the birth. The interviews were conducted 9 to 12 months after delivery.

### **Participants**

The participants included in the C-section and in the control group were approached in consecutive order of the delivery recorded in the data base. We tried to interview every woman who provided a valid telephone number.

The inclusion criteria were the following: having given birth, by C-section, respectively by vaginal delivery in the previous year and giving consent to be part of the study, after being informed. Exclusion criteria consisted of any history of previous gastrointestinal diseases.

### **Statistics**

We used a statistical commercially available statistical package SPSS 20.0 Version for Windows to analyze the data. Descriptive statistics and parametric and nonparametric comparison tests were used. Significance threshold was set at  $p < 0.05$ . Relative risk (95% CI) of C-section women to develop IBS was estimated by Chi2 test.

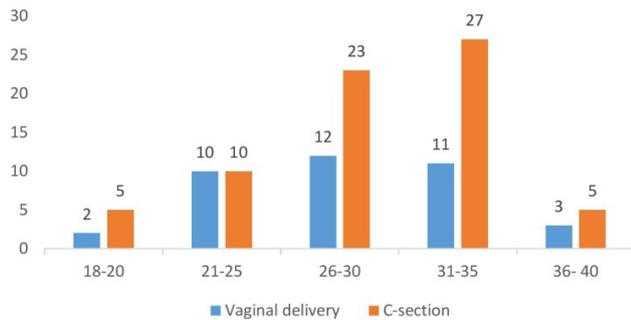
Ethical issues: The study was approved by the local ethics committee and conducted according to the Helsinki Declaration on Studies on Humans and Animals.

### **Results**

We called every woman who gave birth during the period January-June 2020. We obtained 70 interviews from women who delivered by C-section (study group) and 41 by those who had given birth naturally (control group). From these 41 participants who replied, three were discarded because they had bowel disorders before the delivery. Thus, only 38 were accepted to serve as control because they had no previous bowel symptoms.

### **Characterization of the groups**

The mean age in the case group and in the control group was 29 (SD4.85) and 28.4 (SD±4.97) years respectively. Distribution of subjects according to age groups is illustrated in figure 1. There were more subjects from rural areas than from urban areas, in both the study group (56%) and in the control group (63%).



**Figure 1.** Subjects age distribution in study and control group.

The distribution of C-sections and vaginal deliveries for patients in both groups are detailed in the tables below (Table I and Table II).

**Table I.** Number of C-sections in the study group.

Study group			
Nr. of C-sections	1	2	More than 2
Nr. of patients	48	22	0
Percentage	68.5%	31.4%	0%

**Table II.** Number of vaginal deliveries in the control group.

Control group				
Vaginal deliveries	1	2	3	More than 3
Nr. of patients	12	20	6	0
Percentage	31.5%	52.5%	16%	0%

### Prevalence of IBS

The overall prevalence of IBS according to the Rome IV criteria in the group of 108 women was 4.6% (5 patients). In the study group there were 3 out 70 (4.3%) patients with IBS, while in controls there were 2 out 38 (5.2%).

Statistical analysis inquired the hypothesis of the study, showing no significant statistical association between the way of delivery and the early onset of IBS. RR was 0.814, ( $X^2 = .053, p > .05$ ).

### Clinical features

All the patients diagnosed with IBS had subtype C which is the IBS subtype associated with constipation.

Abdominal pain after delivery was present in 49% of the subjects in study group (34 out of 70) and in 32% of the subjects in the control group (12 out of 38). Table III shows the abdominal pain distribution according to time intervals after delivery.

**Table III.** Abdominal pain distribution and duration in study and control groups (interval after delivery).

Abdominal pain	≤ than 2 months	More than 2 months (2-12 months)	No pain reported	Total
Study group	31	3	36	70
Control group	10	2	26	38

**Table IV.** Transit alterations distribution and duration in C-section patients and controls according to time intervals after delivery.

Transit alterations	< than 2 months	More than 2 months (2-12 months)	No alterations reported	Total
C-section	22	4	44	70
Control	10	3	25	38

The mean duration of pain that lasted less or equal than two months was almost two weeks (13.46 days,  $SD \pm 13.6$ ).

From Chi-square test results we find that C-section is not a risk factor for middle-term post-partum pain compared with natural delivery ( $X^2 = 2.909, p > .05$ ).

Transit alterations after birth were reported by 37% women with C-section (26 out of 70) and by 34% women in the control group (13 out of 38). Table IV presents the distribution of transit alterations according to time interval after delivery.

The most common symptom overall was constipation. Only two subjects in the case group reported diarrhea.

According to statistical analysis ( $X^2 = .092, p > .05$ ), C-section subjects did not present a higher risk to develop postpartum constipation than subjects who delivered normally.

### Discussion

According to previous studies, IBS patients have a higher rate of abdominal and pelvic surgical interventions than non-IBS subjects [16-18].

The aim of this study was to establish if C-section, an obstetrical surgery intervention, is a risk factor for early onset of IBS.

Statistical analysis performed on the obtained data shows no significant statistical correlation between the way of delivery and the early onset of IBS. These are first data reported from Albania.

IBS-C was the only subtype detected in this study and this may be explained probably because of the association between pregnancy and constipation, although the statistical analysis shows no significant correlation between the way of delivery and constipation.

A systematic review from 2002 concerning the IBS association with abdominal and pelvic surgery reported increased prevalence of IBS in patients with hysterectomy (18% vs. 12%) and cholecystectomy (4.6% vs. 2.4%) [7]. In 2004, another study reached the same conclusions: cholecystectomy and hysterectomy rates are triple (12.4% vs. 4.1%) respectively double (33.2% vs. 17%) in IBS patients compared with non IBS controls [18]

In another study from 2011, IBS and abdominal pain may be caused by gynecologic surgery. The prevalence of those conditions obtained during the 12 months after hysterectomy and tubular ligature was 8% for hysterectomy and 5% for the tubular ligature group [19].

This trend is confirmed by the latest study, which revealed that the rate of hysterectomy (9.5% vs 6.1%) and cholecystectomy (15% vs. 7.6%) was higher in IBS subjects, but not the rate of appendectomy which was similar in case and controls [1].

Not all the data are convergent with these results. A prospective study that investigated the relation between elective gynecological surgery for non-pain recommendation and IBS did not find a statistical significance in 2.7% of the subjects that developed IBS 12 months post-hysterectomy [6]. Neither de novo constipation, aggravation of constipation or difficulties of rectal emptying were connected with pelvic surgery in the three-year follow-up study [14].

With a 4.3% IBS prevalence in the study group, we may assume that a large cohort may provide more accurate data on the early onset of IBS after C-section.

In this study two patients from the study group had post-operative diarrhea but none in the control group. Altered bowel movements after birth are reported with similar values in both surgical and control group: 37% vs. 34%. Thus, abdominal pain was present in a higher degree in study group (49%) compared to control group (32%).

The proportion of cases that reported abdominal pain that lasted less than 2 months was higher than the controls (44% vs. 26%). This may be explained by the fact that normal delivery does not imply large sections of abdominal tissues from skin to peritoneum plus the healing process.

Otherwise, the proportion of subjects that reported abdominal pain that lasted more than 2 months was similar in both groups (5.2% in study group vs 4.2% in controls) and is identical with the prevalence of IBS cases in the groups. The IBS patients identified by this study had at least 6 months since the onset of abdominal pain.

Our database research did not find any similar studies performed on patients who underwent C-section. We have to admit that C-section is a surgical procedure usually performed on healthy individuals. Maybe a larger study would shed a better light on the possible correlation between C-section and IBS symptoms.

In our sample, statistical analysis could not confirm the data from the literature that IBS is more frequent after C-section compared with vaginal delivery.

This may be explained if we take into consideration cultural particularities of the patriarchal Albanian society, where women are not prioritized as much as individuals but according to the roles they have, in this case motherhood being the main trait that characterizes the patient sample. We can also consider a higher resistance of these patients to surgical stress or that these women may not consider their symptoms bothersome, but focus more on the newborn well-being.

A paper from 2014 suggests that the use of antenatal and postnatal care services by Albanians may be improved by women's empowerment towards individual factors like social, economic and domestic violence [20].

More anthropological data about the dynamics of Albanian family can provide better understanding and data.

This study has some limitations: the number of participants and the short period of time post birth. Also, being conducted in a single center, with approximately 1000 births/year, while a multicenter analysis could provide more data. A strong point is that this is a pioneer study for IBS in Western Balkans and especially in Albania.

Because of the limitations of this study, further analysis is required. Hopefully, gathering more data in the years to come and making a possible follow-up of the subjects investigated here would be more relevant and even change the results.

### Conclusions

The prevalence of IBS in Albanese women with ages between 18 and 40, interviewed 9 to 12 months after giving birth, was 4.6%. This result is similar to data from the global prevalence of IBS from the Rome Foundation Global Survey. In this group, delivery by C-section does not have a role in the developing of early onset of IBS, nor in respect to abdominal pain or transit alterations, compared to a natural delivery. These data may be the result of specific psychosocial and cultural factors that may affect individual symptom reporting and coping in this country.

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### Annex 1. Questionnaire for C-section /vaginal delivery and Irritable bowel syndrome in Albania.

1. Name initials
2. Age
3. Do you live in a rural/urban area?
4. Have you had previous abdominal pain?
5. If yes:
6. Since when?
7. How frequently?
8. Have you had previous constipation /diarrhea/ bloating?  
If yes:
9. Since when?
10. How frequently?
11. Have you been diagnosed with any of these:  
IBS /inflammatory bowel disease/ cancer/ other intestinal disease
12. Did you give birth with a C- section? YES? NO,  
If yes, how many C- sections did you have?  
How long ago?
13. Did you have any abdominal / pelvic surgery? If YES, what type      How long ago?.....
14. Did you feel abdominal pain after the operation? (not at operation site/ incision) / After giving birth? For how long?
15. Did you experienced transit alteration after the operation/ giving birth? Yes/No  
What type: constipation/ diarrhea
16. How long lasted the transit alterations? Days, weeks, months
17. Do you feel NOW pain in any part of the abdomen? Yes/No
18. For how long you have this pain?  
1 week/ weeks.....1 month./.... 12 months
19. How often did you feel this pain in any part of your abdomen?
  - Less than 1 day/month
  - 1 day a month
  - 2-3 days a month
  - 1 day a month
  - 2-3 days a week
  - Most of the days
  - Every day
  - Many times a day or continuously
20. Is the abdominal pain released or impaired by defecation)? (% of cases with pain)  
0% Never  10%  20%  30%  40%  50%  60%  70%  80%  90%  100% Always
21. How often have you defecated more often or rarer as usual since you have this pain? (% cases with pain)  
0% Never  10%  20%  30%  40%  50%  60%  70%  80%  90%  100% Always
22. How often have your feces been softer or harder than they usually are, since you had this pain? (% cases of pain)  
0% Never  10%  20%  30%  40%  50%  60%  70%  80%  90%  100% Always
23. If yes, for how long have you had these modifications?  
1 week/ weeks..... 1 month..../.....12 months
24. How is your stool when you have the abdominal pain?
  - Normal
  - Constipation
  - Diarrhea
  - Both (constipation and diarrhea)
25. Can you say if your abdominal pain and stools have changed after birth compared to before?