

# The relation between gum chewing in early post-operative period and the return of gastro-intestinal function after caesarean section

## Abstract

**Background:** The term “paralytic ileus” refers to more severe prolonged inhibition of bowel function, as differentiated from the usual type of uncomplicated postoperative ileus that lasts no more than 3 days.

**Patients and methods:** 200 women undergoing cesarean section divided into 2 groups:

- Group A: 100 post-operative patients were given gum chewing only.
- Group B: 100 post-operative patients will be monitored with no intervention applied.

**Results:** There is a highly significant difference between group A and group B regarding to time to first flatus and time to discharge with P.value (<0.001) and a significant difference between them as regard Time to hear intestinal sounds with P. value (0.042).

**Conclusion:** There is a highly significant difference between group A and group B regarding to time to first flatus and time to discharge with P.value (<0.001) and a significant difference between them as regard Time to hear intestinal sounds with P. value (0.042).

**Keywords:** caesarean, post-operative period, anesthesia, abdominal examination, maternal age

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## Background

Although C-section sometimes lifesaving but it has many complications, one of these complications is ileus which is temporary inhibition of gastrointestinal function, it's treatment is supportive by gastric decompression, together with IV hydration and correction of electrolyte abnormalities and discontinuation of anti-kinetic drugs.<sup>1</sup>

The retrieval of full bowel movement occurs within seventy two hours post ileus in uncomplicated cases.<sup>2</sup> While in cases that has impaired functional ability of bowel more than 3 days, this is called paralytic ileus.<sup>3</sup>

Many factors can affect postoperative bowel motility such surgery (abdominal and nonabdominal), infection, inflammation, severe pain, medications, general anesthesia, and electrolyte abnormalities.<sup>4</sup>

## Aim of the study

The aim of the study is to investigate the effect of gum chewing on intestinal sounds, passing gas and intestinal evacuation after cesarean birth under spinal anesthesia in order to shorten hospital stay and postoperative ileus.

## Patients and methods

This was a randomized controlled study of patients presented to us at the Obstetrics and Gynaecology department of Kasr Al-Ainy Hospital, Cairo University during the period from September 2018 till March 2019.

## Population of study & disease condition

Two hundred women having had caesarean section; under spinal anesthesia, were put under observation during the post partum period, recruited from the obstetrics and gynecology departments of Kasr Al-Ainy Hospital.

Sample size calculation was done using the comparison of post Cesarean time to regain intestinal sounds between mothers treated with gum chewing (G1) and non-treated mothers (G2), as it was the primary outcome of our study. As reported in previous publication, the mean  $\pm$ SD of time to regain intestinal sounds in G1 was 11.76 $\pm$ 1.9h, and in G2 it was 16 $\pm$ 1.7h. Accordingly, we calculated that the minimum proper sample size was 15 patients in each arm to be able to reject the null hypothesis with 80% power at  $\alpha=0.05$  level using One Way Analysis of Variance test. Sample size calculation was done using G\*Power software version 3.1.2 for MS Windows, Franz Faul, Kiel University, Germany.

## Inclusion criteria

- Maternal age from 18 to 40 years.
- Primi-para or multi-para with previous vaginal delivery undergoing an elective cesarean section under spinal anesthesia.
- Minimum of 6-hour fasting time prior to surgery.

## Exclusion criteria

- Any contraindication to spinal anesthesia (patient refusal, coagulopathy, significant hypovolemia, increased intra cranial pressure).

- b. High risk pregnancies (pre-eclampsia and eclampsia and any medical disorders such as hypo-thyroidism and diabetes mellitus).
- c. Patients with a previous laparotomy including previous caesarean section.
- d. Patient with any Intra-operative complications.
- e. Patient on Narcotics.
- f. Patient with electrolyte abnormalities.
- g. Patients who refused our assessment or who were discharged or transferred to other units.

### Methodology in details

The patients were subjected to their groups by a randomized way, 100 Labels bearing Group A and 100 Labels bearing Group B were inserted into opaque and sealed envelopes, underwent a toss and randomly handed over to the patients pre-operatively, The envelopes containing the group allocation were personally opened by myself, the patient's name and group name were recorded accordingly and therefore each patient were subjected to their allocated group trial study post-operatively as per what their label had denoted.

All patients were subjected to the following:

- a. Informed consent after explaining the aim of the study, procedure and possible hazards.
- b. Detailed history taking including full obstetric history, medical history, surgical history and bowel habits.
- c. Full physical examination including face, neck, chest and abdominal examination
- d. Pre-operative electrolytes investigation (once only) to exclude any electrolyte imbalance (Na, K, Ca, Mg).
- e. The women who underwent cesarean birth under spinal anesthesia were divided equally into two groups (100 patients in each group):
  - 1) Group A: 100 post-operative patients were given gum chewing only.
  - 2) Group B: 100 post-operative patients will be monitored with no intervention applied.
- f. Gum chewing was started one hour after the operation.
- g. Intestinal sounds were checked every 30 minutes with a stethoscope over the abdomen and the first time passing gas and the first evacuation time were recorded by asking the mother.
- h. The patients of Group A were instructed to chew sugar-free gum and were prohibited to gum chewing during the night between 12:00 a.m to 8:00 a.m.
- i. The duration of caesarian section, the surgeon's name and title and whether the uterine incision was repaired intra-abdominally or extra-abdominally was recorded.

### Statistical methods

**Data collection:** It was done for all preoperative, operative and postoperative data of the included patients in the study. Data were collected through direct observations and surgery room notes, admission log, operative notes, operation log and clinical records.

These data are:

- a) Age
- b) Obstetric history
- c) Bowel habits
- d) Height and weight
- e) Vital signs
- f) Surgeon name
- g) Surgeon title
- h) Duration of caesarean section
- i) Type of manipulation
- j) Uterus repair ( intra or extra abdominal
- k) First bowel sound
- l) First flatus
- m) First defecation

### Results

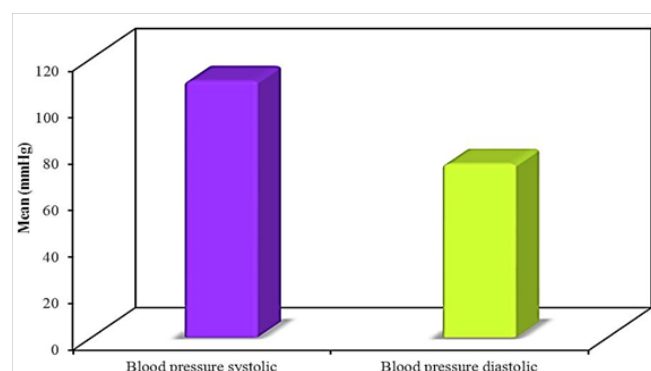
This was a randomized controlled study was conducted on 200 women having had caesarean section; under spinal anesthesia. (100 cases after caesarean section were given a gum chewing only and the other 100 cases had no intervention applied).

#### Descriptive data

The mean age of the studied cases was 24.60±4.17 years, the mean gestational age was 38.60±2.74 weeks, the mean systolic blood pressure was 110.30±5.91 and the mean diastolic blood pressure was 74.60±9.07 as showed in Table 1 (Figure 1).

**Table 1** Descriptive data of the studied women (n= 200)

	Range	Mean ± SD
Age (years)	18–40.0	24.6±4.17
BMI (Kg/m <sup>2</sup> )	19–32.0	27.05±3.32
Pulse (Beat/min)	65.0–80.0	72.72±4.66
Blood pressure systolic (mmHg)	100–120.0	110.3±5.91
Blood pressure diastolic (mmHg)	60.0–90.0	74.6±9.07
Gestational age(weeks)	37.0–40.0	38.6±2.74



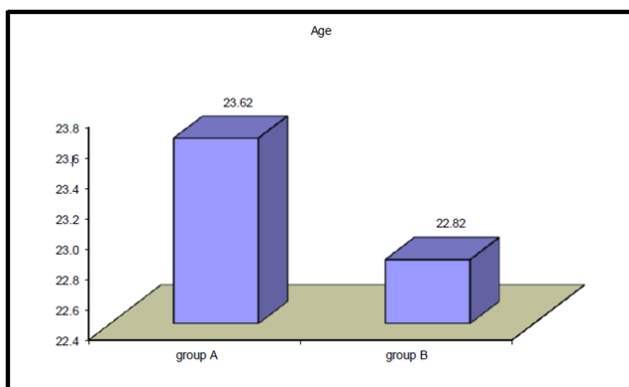
**Figure 1** Distribution of the studied cases according to Blood pressure systolic (mmHg) and Blood pressure diastolic (mmHg).

There was no significant difference between the two groups as regard gestational age, maternal age(yr), Height and weight (Table 2) (Figure 2) (Figure 3).

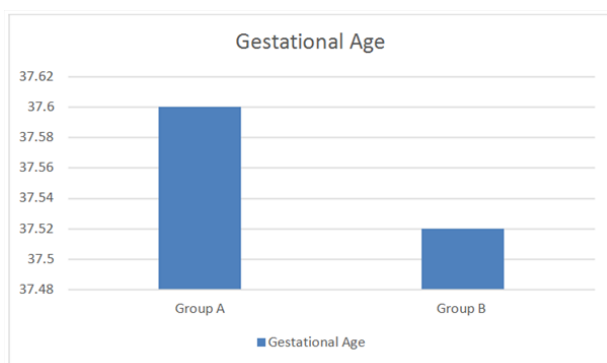
**Table 2** Demographic data of both groups

	Group A (gum chewing) No.=100		Group B (no interventions) No.=100		P-value	Sig
	Range	Mean±SD	Range	Mean±SD		
Age(Yr)	18– 40	23.62±3.55	18–40	22.82±4.31	0.063	NS
Height (Cm)	153– 165	158.6±3.20	153–165	158.58±2.89	0.948	NS
Weight (Kg)	59– 95	76.3±8.85	59–95	76.45±8.95	0.866	NS
BMI (Kg/m <sup>2</sup> )	19– 32.0	26.05±3.12	19–32.0	26.15±2.32	0.23	NS
Gestational Age at time of delivery (W±D)	37.0 – 40	37.60±0.94	37–40.0	37.52±0.84	0.12	NS

>0.05 NS, non significant; <0.05 S, Significant; < 0.01 HS, Highly significant; \*, Chi-square test; •, Independent t-test



**Figure 2** Maternal age.



**Figure 3** Gestational age at time of delivery.

As regard to Obstetric history , Duration of Cs and manipulation there was no significant difference in between the two groups with P=0.06, 0.222, 0.634 respectively (Table 3).

There is no significant difference between group A and group B as regard to Normal bowel habits with P Value (1.000) and (0.866) respectively (Table 4).

**Table 3** Comparison of maternal obstetric history in both groups

		Group A (gum chewing) No.=100		Group B (no interventions) No.=100		P-value	Sig
		No.	%	No.	%		
Obstetric history	primipara	32	32%	40	40%	0.06	NS
	multipara	68	68%	60	60%		
Age	18-25	26	26%	38	38%	0.066	NS
	26-30	52	52%	42	42%		
	31-35	11	11%	10	10%		
	36-40	11	11%	10	10%		
Duration of Cs	30min to 1h	80	80%	78	78%	0.222	NS
	1h to 2h	20	20%	22	22%		
Surgeon title	Senior resident	20	20%	25	25%	1	NS
	Junior resident	80	80%	75	75%		
Uterus repair	Intra-abdominal	20	20%	25	25%	0.231	NS
	Extra-abdominal	80	80%	75	75%		

NS, non significant; S, significant; HS, highly significant; \*, chi-square test

**Table 4** Comparison of the clinical history in both groups

		Group A (gum chewing) No.=100	Group B (no interventions) No.=100	P-value	Sig.
Normal bowel habits	Everyday	60 (60.0%)	59 (59%)	0.866	NS
	Every two days	20 (20%)	21 (21%)		
	Every three to five days	20 (20%)	20 (20%)		

NS, non significant; S, significant; HS, highly significant; \*, chi-square test; •, independent t-test

### Intervention

There is a highly significant difference between group A and group B regarding to time to first flatus and time to discharge with P.value (<0.001) and a significant difference between them as regard Time to hear intestinal sounds with P. value (0.042) (Table 5).

**Table 5** Distribution of women in the two groups according to intestinal functions after cesarean section

		Group A (gum chewing) No.=100	Group B (no interventions) No.=100	P-value	Sig.
Time to hear intestinal sounds (h)	Mean±SD	11.18±1.11	16.96±1.05	0.042	S
	Range	2–27	4–24		
Time to first flatus (h)	Mean±SD	13.00 ± 1.40	27.55±1.42	<0.001	HS
	Range	4–24	10–46		

Table Continues...

		Group A (gum chewing) No.=100	Group B (no interventions) No.=100	P-value	Sig.
Time to first defecation	Mean±SD	16.00 ± 1.20	20.00±1.11	0.04	S
	Range	8–26	10–28		
Time to discharge (h)	Mean±SD	43.00 ± 1.40	47.55±1.42	<0.001	HS
	Range	45–49	48–56		

## Discussion

Oral fluids, early eating and chewing gum are advised postoperatively to help early returning of function of the GIT post CS.<sup>5</sup>

The aim of work of the present study was to investigate the effect of gum chewing on intestinal sounds, passing gas and intestinal evacuation after cesarean birth under spinal anesthesia in order to shorten hospital stay and postoperative ileus. To elucidate these aim 200 women having had a caesarean section under spinal anesthesia were included, (100 cases were given a gum chewing only and the other 100 cases had no intervention applied).

A previous study made by Abd-El Maeboud et al.<sup>6</sup> revealed a similar results with faster returning of bowel sounds in women chewed gum.<sup>6</sup>

A previous study made by Ledari et al.<sup>7</sup> showed results in agreement with the present study, showing bowel movement recover to its function after 21.9 hours in group with chewing gum while it was 26.1 hours in non chewing gum group.<sup>7</sup>

In the present study, ladies who chewed gum group flatulated after an average of 13.00±1.40 hours while those in the control group after 27.55±1.42 hours. This is in agreement to a study made by Kafali et al.<sup>8</sup> women who delivered by caesarean section where women in the chewing gum group flatulated 22.4 hours after surgery and women in the control group flatulated 31 hours after delivery.<sup>8</sup>

Several meta-analysis researches revealed that chewing gum helps bowel motion after surgery.<sup>9,10</sup> The results of the present study from this study can contribute to future meta-analysis studies. Some studies stated that chewing gum increases intestinal motility after abdominal surgery, accelerates the healing process, and shortens the time to discharge from the hospital.<sup>9,10</sup>

In the study of Abd-El-Maeboud et al.,<sup>6</sup> the women in the chewing gum group were discharged home faster than non chewing gum group. According to the results obtained from our study, the time of discharge after surgery in the chewing gum group was four hours earlier. This finding was statistically highly significant and it is clinically important for maternal and infant health.<sup>6</sup>

A previous studies made by Harma et al.,<sup>11</sup>; Çevik and Başer;<sup>12</sup> Shang et al.<sup>13</sup> showed results in accordance with the results obtained from the present study regarding shorter hospital stay postoperatively. In this study, the women who chewed gum had shorter discharge times (43.00±1.40hours) than those in the control group (47.55±1.42 hours).<sup>11–13</sup>

## Limitations

The main limitation of the study is that:

- A. We did not follow maternal condition on the following days.

- B. We did not collect data about pain and analgesic requirement.

- C. We did not follow up fetal condition, eg: the first nursing.

## Recommendations

- a) Women should be offered chewing gum as it prevents ileus and accelerate appearance of intestinal sounds and accelerate the opening of the bowel.
- b) Further studies to other types of patients, eg: previous caesarean section.
- c) Further studies to include other interventions, eg: flavored chewing gum.

## Conclusion

According to the findings obtained in this study, There is a highly significant difference between group A and group B regarding to time to first flatus and time to discharge with P.value (<0.001) and a significant difference between them as regard Time to hear intestinal sounds with P. value (0.042).

It can be added to post-caesarean care without any concern on early post-operation feeding as a low-cost, safe and tolerable treatment in early intestinal stimulation to reduce ileus associated complications.

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## Funding

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## Conflicts of interest

The authors declare there are no conflicts of interest.

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