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The Impact of Laxative Drops on The Bowel Motility and Post Caesarean Section Recovery

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ABSTRACT

Background: Enhanced recovery after surgery (ERAS) has been considered as a widely dependable paradigm to increase the goodness of patient care by better management of surgical patients in the perioperative period. There is no specific method has been established yet to prevent and treat postoperative ileus but different strategies were used, however the efficacy of them were unclear.

Purpose: To determine the effectiveness of stimulant laxative on the resumption of intestinal motility and its reflection on the post caesarean section recovery.

Patients and methods: A prospective cohort study, included 120 women who had caesarean section (CS) in Menoufia University Hospital, from June 2021 till October 2021. They were divided into case group (A) which included 60 patients who drank a cup of anise added to it 15 drops of picolax 4 hours after CS and control group (B) included 60 patients who just drank a cup of anise only 4 hours after surgery. Resumption of intestinal sound, first flatus and motion were compared between the two group.

Results: Case group which used laxative showed significantly shorter time for first intestinal sounds (Mean ± SD 6.87 ± 1.38), time to first flatus (Mean ± SD 16.78 ± 4.46) and mean time to first bowel movement (Mean ± SD 20.65 ± 5.81) ($p < 0.05$).

Conclusion: Usage of stimulant laxative 4 hours after CS enhance the intestinal motility and improved the CS recovery.

Keywords: Caesarean Section, Ileus, Sodium-picosulfate

INTRODUCTION

Cesarean section is considered the most commonly performed surgery in the world. A recent study documented that Egypt ranked 3rd among world countries with an estimated rate of cesarean section of 51.8% [(1)]. Cesarean section rates have been steadily increasing in Egypt from a low of 4.6% in 1992, 6.7% in 1995, 10.3 % in 2000, to about 52% in 2014 [(1)].

Ileus is considered as prevalent and unpreventable sequel of abdominal operations which has no definitive mortality but increases morbidity after surgery [(2)]. Postoperative ileus (POI) is defined as the transient cessation of harmonious bowel motility after surgical intervention, which lead to delayed intestinal motility after operation. It is developed within 5 days after open abdominal surgery or 3 days after abdominal endoscopic surgery [(3)].

Gynecologist and obstetricians prefer not to introduce oral intake after abdominal or caesarean section until resumption of bowel function because they believe that early feeding worsen postoperative ileus. Resumption of bowel function is known as return of bowel motility, passing gas, bowel movement, and feelings of hunger[(4)].

Delaying the resumption of oral food intake can negatively affect production of the mother's milk and breastfeeding and requires intravenous nutrition, which extends the hospital stay and increases the cost of postoperative care. It also increases the rate of cellular breakdown, delays healing, and increases the likelihood of infection [(5)].

Malnutrition, nosocomial infection, pulmonary disorders, deep venous thrombosis, and decreased patient satisfaction are considered as followed sequels of delayed postsurgical oral food intake [(6)]. Enhanced recovery after surgery (ERAS) is considered now as an adopted protocol aiming to improve the patient care through better preoperative management of surgical patients [(7)].

Now, enhanced recovery after surgery pathways are applied to different surgeries including colorectal, bariatric, gynecologic procedures and knee replacement. Recently, application of these models in cesarean delivery showed significantly reduction in hospital stay duration and costs [(8)].

Sodium picosulfate is a contact stimulant laxative used as a treatment for constipation or to prepare the large bowel before colonoscopy or surgery. It is sold under the trade names sodipic picofast, laxoberal, laxoberon, purg-odan, picolax, guttalax, namilax, pico-salax, picoprep, and prepopik, among others [(9)].

Sodium picosulfate is not absorbed from the gastrointestinal tract or its active metabolite. It is not detectable in breastmilk. Sodium picosulfate can be taken during breastfeeding and no special precautions are required [(9)].

This study hypothesized that, using stimulant laxative (Picolax) in women who underwent CS can improve and speed the resumption of postoperative intestinal motility, so early feeding, less hospital stay and better postoperative recovery would be possible.

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PATIENTS AND METHODS

This comparative cohort study performed from June 2021 till October 2021.

Ethical considerations:

The registration and approval of the Ethical Committee of the Faculty of Medicine, Menoufia University of the trial was recorded Ethical consideration included written consent and explanation of the steps, aim, results and abnormal data collected; all were shared with the patients. This work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

The study population was divided into two groups:
Group A (case group):

Included 60 women who ingested a cup of anise with addition of 15 drops of picolax (Egyptian Int. Pharmaceutical Industries CO. E.I.P.I.CO. 10th of Ramadan city-Industrial area B. Egypt. Each 1 ml contains: **S**odium picosulfate 7.5 mg, and inactive ingredients**:** Methyl paraben sodium, sorbitol 70% solution, purified water). 15 drops were equal to about 5 mg of sodium picosulfate. **Group B (control group):** Included 60 women who just drank a cup of anise without any medications.

Participant's inclusion criteria were gestational age 38 to 42 weeks, no abnormal vital signs of mother or fetus, uncommon intraoperative complications, and no medical gynecological diseases. Postoperative or intraoperative uterine atony, excessive manipulation of the intestine, intraoperative bladder injury, intestinal injury, massive blood loss and blood transfusion all were considered as exclusion criteria of the study

The preoperative data of the participants in both groups were collected and documented in both group included the patients' age, parity, body mass index (BMI), history of previous CS and history of previous pelviabdominal surgery. The operative information were documented including the type of anesthesia, fasting duration before CS, type of intraoperative adhesions, using of intraoperative drain, duration of surgery and the analgesia used postoperatively.

In both groups, after ingestion of the cup of anise 4 hours after CS auscultation of intestinal sounds were performed every one hour after ingestion till the first audible intestinal sound was heard. Distention, pain, cramps, vomiting and nausea were recorded. The patient's relatives or patient themselves were asked to document when the patient passed flatus and when passed motion.

Case and control groups had the same care after CS. Oral or rectal intestinal stimulants after CS were not administered by any participants. The oral fluids and soft foods were begun for the participants after resumption of bowel sounds and regular diet after recorded flatus.

Collected data from both groups included time of first audible intestinal sounds, time of first flatus, time of first bowel motion, vomiting, distention and need for another dose after 24 hours.

Statistical consideration:

Sample size: based on previous study of **Yousefi *et al.*[5]**, two tailed sample size calculation rendered 120 participants for prospective cohort study (0.05, power 0.85) the calculation was done using GPower 3 Software.

Statistical analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp).The Kolmogorov-Smirnov was used to verify the normality of distribution of variables. Qualitative data were presented as frequency and percentage and were compared using Chi-square test (Fisher or Monte Carlo). Quantitative data were presented as mean, standard deviation, median, and range and were compared by Student t-test for normally distributed quantitative variables and by Mann Whitney test for not normally distributed quantitative variables. P value < 0.05 was considered significant.

RESULTS

Most of the participants enrolled in the study were multipara, history of previous one CS was documented in most of women and mostly there was no history of any pelviabdominal surgery (appendectomy and cholecystectomy were the only recorded) as presented in table 1.

Table (1): The preoperative data of the participants in the case and control groups

Variable	Case group (A) (n=60)	Control group (B) (n=60)	Test of sig.	p-value
Age (years)				
Median (Min. – Max.)	26.5 (18 – 41)	26.5 (19 – 41)	t=0.284	0.777
Mean ± SD.	27.2 ± 5.8	26.9 ± 5.1		
Parity				
Nullipara	14 (23.3%)	10 (16.7%)	χ^2 = 1.359	0.507
Primipara	16 (26.7%)	21 (35%)		
Multipara	30 (50%)	29 (48.3%)		
Median (Min. – Max.)	1.5 (0 – 5)	1 (0 – 4)		
Mean ± SD.	1.6 ± 1.3	1.6 ± 1.1	U= 1776.0	0.896
BMI (kg/m2)				
Median (Min. – Max.)	28 (21 – 37)	28 (21 – 37)	t=0.282	0.778
Mean ± SD.	28.4 ± 3.7	28.2 ± 3.4		
History of previous CS				
No	17 (28.3%)	13 (21.7%)	χ^2=2.939	0.436
1	24 (40%)	33 (55%)		
2	15 (25%)	12 (20%)		
3	4 (6.7%)	2 (3.3%)		
Median (Min. – Max.)	1 (0 – 3)	1 (0 – 3)		
Mean ± SD.	1.10 ± 0.90	1.05 ± 0.8	U= 1765.50	0.846
History of another pelvic surgery				
No	36 (60%)	41 (68.3%)	χ^2=0.966	0.672
Appendectomy	20 (33.3%)	16 (26.7%)		
Cholecystectomy	4 (6.7%)	3 (5%)		

SD: Standard deviation. χ^2: Chi square test t: Student t-test. U: Mann Whitney test
p: p value for comparing between the two studied groups

All the preoperative and intraoperative data showed no statistical significant difference between the case group and the control group (Table 2)

Table (2): The operative data of the participants in the case and control groups

Variable	Case group (A) (n=60)	Control group (B) (n=60)	Test of sig.	p-value
Type of anesthesia				
Spinal	56 (93.3%)	57 (95%)	χ^2=0.152	1.000
General	4 (6.7%)	3 (5%)		
Fasting duration (hours)				
Not fasting	10 (16.7%)	7 (11.7%)	χ^2=0.617	0.432
Fasting	50 (83.3%)	53 (88.3%)		
Fasting duration				
Median (Min. – Max.)	8 (6 – 10)	8 (5 – 10)		
Mean ± SD.	7.64 ± 1.29	7.57 ± 1.28	t=0.292	0.771
Duration of surgery (min.)				
Median (Min. – Max.)	44.5 (32 – 90)	42 (32 – 60)		
Mean ± SD.	46 ± 11.1	43.47 ± 7	U= 1642.50	0.406
Drain	3 (5%)	2 (3.3%)	χ^2=0.209	1.000
Intraoperative adhesion				
No adhesion	43 (71.7%)	49 (81.7%)	χ^2=2.873	0.274
Thin adhesion	14 (23.3%)	7 (11.7%)		
Thick adhesion	3 (5%)	4 (6.7%)		
Analgesia used				
PCA	11 (18.3%)	10 (16.7%)	χ^2=0.205	0.903
NSAID	13 (21.7%)	15 (25%)		
TAB block	36 (60%)	35 (58.3%)		

SD: Standard deviation. χ^2: Chi square test t: Student t-test U: Mann Whitney test
p: p value for comparing between the two studied groups

Regarding the analysis of postoperative data, audible intestinal sound was recorded significantly earlier in case group than the control group. Also women enrolled in case group documented early passage of flatus and motion than women included in control group with highly significant difference between the both groups. There were 25 participants in the control group complained of distention while 8 participants only in case group complained from it. This pretend significant difference and improvement from distention in the case group than control group (Table 3 and figure 1).

Table (3): Comparison between participants in the case and control groups regarding intestinal sound (hours), passage of flatus and motion

Variable	Cases (n=60)	Control (n=60)	P value
Intestinal sound (hours) Median (Min. – Max.) Mean ± SD.	 7.0 (5.0 – 10.0) 6.87 ± 1.38	 11.50 (8.0 – 17.0) 11.63 ± 2.09	 <0.001*
Passage of flatus Median (Min. – Max.) Mean ± SD.	 16.0 (9.0 – 29.0) 16.78 ± 4.46	 22.50 (16.0–36.0) 23.33 ± 4.28	 <0.001*
Motion Median (Min. – Max.) Mean ± SD.	 20.0 (12.0 – 38.0) 20.65 ± 5.81	 29.0 (22.0 – 44.0) 29.77 ± 5.15	 <0.001*
Vomiting	1 (1.7%)	2 (3.3%)	1.000
Ileus	1 (0.7%)	2 (3.3%)	1.000
Another dose No need 1 2 3	 52 (86.7%) 6 (10%) 1 (1.7%) 1 (1.7%)	 – – – –	 – – –
Distension	8 (13.3%)	25 (41.7%)	0.001*

χ^2: Chi square test. SD: Standard deviation. t: Student t-test
p: p value for comparing between the two studied groups
*: Statistically significant at $p \leq 0.05$

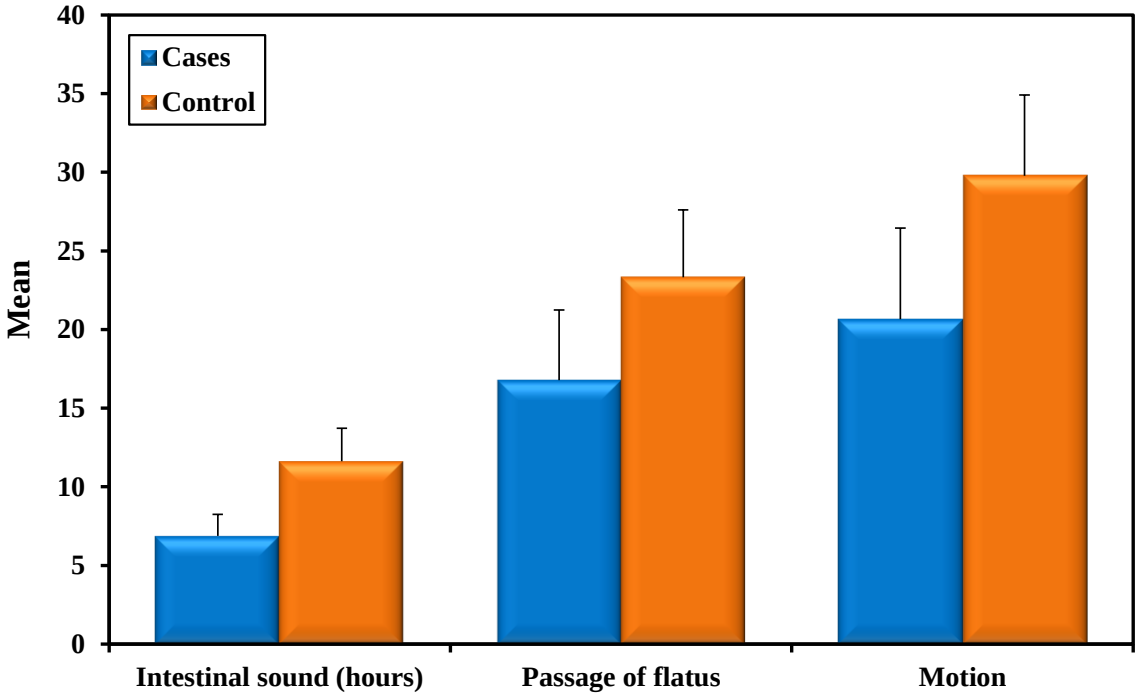

Figure (1): Comparison between the two studied groups according to intestinal sound (hours), passage of flatus and motion

DISCUSSION

Enhanced recovery after surgery (ERAS) considers a widely used current strategy aiming to improve patient care effectiveness [8]. As cesarean section represents the most common procedure performed not in Egypt but worldwide, most researchers effort tries to set different methods (preoperative, intraoperative and postoperative) aiming to improve the recovery after surgery with significant reduction in hospital stay, costs, and hospital morbidity with promotion of the quality of patient care[10].

This study was designed to define the effect of usage stimulant laxative (Sodium picosulfate) in resume the intestinal motility and recovery after CS. Different previous studies used sodium picosulfate as a stimulant laxative alone or in addition to magnesium citrate and other formulas for bowel preparation before colorectal surgeries [11-13].

Previous studies used other modalities to improve intestinal motility as usage of rectal stimulant, early feeding, chewing gum and ingestion of Carum carvi syrup (Bunium persicum Boiss) after CS [5, 3, 14]. This current study may be considered as the first clinical trial using oral sodium picosulfate as postoperative improver of intestinal recovery as most of the studies used it alone or in combination with other substances as rectal preparation before the colorectal surgery.

A systematic review done by **Zhu *et al.*[14]** to estimate the effects of gum chewing following caesarean section considered the potential benefits of its use. The pooled data of six randomized controlled trials (RCTs) (Egypt, Turkey, China, Philippines, Iran and Thailand) provided evidence that gum chewing can reduce the recovery time following caesarean section compared with the control group. Women in the gum chewing group experienced a significant reduction in time to first flatus, time to first bowel sound and time for first stool. These data were in agreement with the results obtained from our study as we recorded that women after CS used picolax had returned intestinal sound within (5-10 hours) after CS. Also passage of flatus and motion were within first 24 hours of the operation so early feeding and returning to their normal life were possible and this is considered as one of the goals of ERAS.

Other studies demonstrated the effect of early oral fluids 6 hours after CS. first bowel sounds was recorded after 10.3 hours in the case group and after 14.4 hours in the control group in most of these studies [3, 15, 16]. These findings are convenient to our results with greater difference in time of resumption of intestinal sound as intestinal sound was within 6.87 ± 1.38 hours in case group in our study. This emphasize that addition of stimulating laxative to liquids after CS improves the intestinal performance rather than usage of liquids alone.

Randomized controlled trial was designed 2019 by **Yousefi *et al.*** [5], to study the effect of the Carum carvi (Bunium persicum Boiss) plant, which is a gas solvent, and the effect of it on the return of bowel activity after caesarean section; the study was on 98 women who had elective CS with general anesthesia. They concluded that first intestinal sound was 10.66 ± 2.38 in case versus 19.54 ± 3.85 hours in control group. Also mean time to first flatus was 13.91 ± 3.73 in case versus 24.82 ± 5.83 hours in control group while, mean time to first bowel movement was 19.31 ± 4.63 in case versus 30.70 ± 10.21 hours in control group. Their data were compatible with ours especially time for intestinal flatus and motion rather than time for intestinal sound as it was early in our study 6.87 ± 1.38 hours). This difference may be due to usage of general anesthesia in CS in **Yousefi** study, and also to time taken by Carum carvi to do its effect [5].

Limitations of the study:

Because, spinal anesthesia was the mostly used in this study, future studies using general anesthesia may establish the greater effect of sodium picosulfate on intestinal motility affected by adverse effect of general anesthesia on intestinal movement. Future research about the effect of the stimulant laxative may be needed to prove or deny our data.

CONCLUSIONS

Cesarean section is considered the most commonly performed surgery in the world. Stimulant laxative may promote bowel function after caesarean section leading to early CS recovery. This shows better promotion of patient care with greater improve in the economic effect through the decrease in the hospital stay after an uncomplicated caesarean delivery especially in a developing country with limited resources.

Disclosure:

Availability of data: All data of the present study are available when requested from the corresponding author.

Acknowledgments: Not applicable.

Conflicts of Interest: No conflict of interest for the authors.

Author Contribution: HF Salama: Project development, Data Collection, Manuscript writing. AA Fathy: Manuscript writing. MN Egiz: Data collection and Manuscript writing.

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