

Comparison of the effect of misoprostol and chewing gum on intestinal movements after cesarean delivery

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Abstract

Cesarean is one of the major surgeries after which mother will need to be hospitalized for a long period of time. One of the leading causes of the increase in the duration of hospitalization of such patients is the surgeons' projections about the development of ileus and defecation. Given the previous studies, misoprostol can increase bowel movements. Moreover, gum-chewing has been recommended as a cheap and available technique for accelerating the resumption of normal Intestinal Movements. The present study is a single-blind randomized clinical trial which has been done on 324 women over 18 years of age with singleton pregnancy who had visited Taleghani Hospital in Arak and was elective cesarean section candidates. The surgery and anesthesia techniques were similar for all patients. These patients were randomized into three groups of 108, namely control, misoprostol, and gum-chewing groups. The patients in these three groups were compared with one another in terms of normal bowel sound, gas passage, defecation and discharge. The results have shown the mean age of a total of 324 patients has been 26.66 years. The results suggest that the time of hearing the first normal bowel sound, the first gas passage, and defecation have been shorter in the misoprostol group, gum-chewing group and control group, respectively. The difference observed between the three groups has been significant at a 0.05 significance level. Furthermore, no significant difference was observed between the patients in the misoprostol and gum-chewing groups and the patients in the control group while reviewing the time of discharge of these patients. The findings have been indicative of the positive effects of the misoprostol and gum-chewing techniques on the intestinal function of patients and mothers' breastfeeding. Also, it has been observed that using misoprostol can be more effective than chewing gum.

Introduction

Cesarean is one of the most common surgeries which are accompanied by some post-surgical changes in the autonomic nervous system which reduce the bowel movements and cause numerous problems.¹ Ileus is defined as a 3 to 5-day delay in the normal bowel movements of patients.² It is one of the most common post-surgeries which extent the period of hospitalization, postoperative pain, abdominal distension, inability to eat after the surgery or to start breastfeeding and ultimately to defer the recovery period.³ From past to present, gynecologists have always been concerned with the beginning of oral intake after cesarean. They have always been concerned with the resumption of bowel function. Bowel movement, defecation, gas passage and hunger are some of the signs of bowel function.⁴

Currently, there is no special treatment for the ileus developed after different surgical operations, including cesarean. Nevertheless, there are some techniques that can be used to reduce postoperative ileus. Some of these techniques are: oral-nasal suctioning, premature oral intake, intravenous fluid injection.^{5,6}

Since there is no specific treatment for this problem, it is crucial to find other methods for reducing the occurrence of ileus in patients.

Chewing gum stimulates the stomach, gastric secretion and digestive materials, because of which the person will be able to eat and there will be more peristaltic movements in their digestive system. Therefore, gum-chewing seems to effectively accelerate patients' recovery from ileus.⁷ Of course, contrary results have been found in this regard in various studies^{8,9} and there is not a single certain conclusion regarding the effects of gum-chewing on recovery from postoperative ileus.

Another treatment which is sometimes used for increasing bowel movements and for treatment-resistant chronic constipation is misoprostol which is a prostaglandin analogue.³ Moreover, it has been observed that prostaglandins can increase bowel movements.¹⁰ Hence, this drug seems to be effective in patients' recovery from ileus.

The present study has aimed to investigate the effect of misoprostol and gum-chewing on Intestinal Movements after cesarean.

Materials and Methods

This study is a single-blind randomized

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Acknowledgments: This work was performed in partial fulfillment of the requirements for degree of Medical Doctor of Pegah Eslami, in School of medicine, Arak University of Medical Sciences, Arak, Iran.

Key words: Misoprostol; Gum-chewing; Cesarean; Ileus.

Contributions: the authors contributed equally.

Conflict of interest: the authors declare no potential conflict of interest.

Funding: the authors gratefully acknowledge the Research Council of Arak University of Medical Sciences (Grant Number: 1223) for the financial support.

Received for publication: 25 January 2018.

Accepted for publication: 15 February 2018.

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Gastroenterology Insights 2018; 9:7608
doi:10.4081/gi.2018.7608

clinical trial on 324 women over 18 years of age with singleton pregnancy who had visited Taleghani Hospital in Arak and was cesarean section candidates. These patients were reviewed based on the criteria determined for entering and exiting the study. All of the patients entered the study after signing cautious consent. Spinal anesthesia was the NA technique used on all patients. The surgical technique used for all patients was a transverse lower (uterine) segment cesarean section including a Pfannenstiel incision in the lower segment with a double-layer repair. Then, the patients were randomized into three groups. 600 milligrams of rectally administered misoprostol was prescribed for the patients in the misoprostol group during cesarean section immediately after removing the placenta. The patients in the second group were asked to chew gum 2 hours after the surgery for an hour three times in the next 24 hours. These patients also received a placebo suppository. The patients in the third group, which was considered as the control group, did not receive any kind of treatment except for a placebo suppository. Six hours after the surgery, the

researcher listened to the sound of patients' bowel movement for four hours, every one hour. The times of first gas passage, first normal bowel sound and first defecation were recorded for each patient (in minutes). Inclusion criteria: women of 18 to 45 years of age, singleton pregnancy, and being an elective (nonemergency) cesarean section candidate.

Exclusion criteria: transformation of the type of anesthesia to general, presence of a clear peritonitis or sepsis, history of intestinal surgery, thyroid disease, underlying cardiovascular disease, blood and liver disorders, inflammatory bowel disease, history of chronic constipation (less than two defecations per week), history of allergic reactions to misoprostol, electrolyte imbalance and history of allergic reactions to acetaminophen.

The obtained results were analyzed using SPSS ver.20 and statistical tests, namely independent-samples t-test, one-way ANOVA and chi-square. In addition, the significance level was considered to be lower than 0.05.

Results

In the present study, the mean age of a total of 324 mothers under study was 26.66 years with a standard deviation of 3.87. Additionally, BMI of mothers was 26.56 kg/m² with a standard deviation of 1.87. No significant difference was found between the three groups under study in terms of age and BMI (Table 1).

Also, by reviewing the results obtained from the present study, it became clear that the time of the first bowel sound was 3.18±1.17 hours after the C-section in the misoprostol group, 3.90±1.59 hours after the C-section in the gum-chewing group, and 5.11±1.20 hours after the C-section in the control group. By investigating the mean time of the first gas passage, it became clear that the first gas passage occurred 6.23±1.35 hours after the surgery in the misoprostol group, 7.35±2.34 hours after the surgery in the gum-chewing group and 9.76±2.42 hours after the surgery in the control group. Moreover, while reviewing the time of the first defecation after the cesarean section, it was observed that the time of the first defecation was 14.59±5.29 hours after the surgery in the misoprostol group, 16.34±6.05 hours after the surgery in the gum-chewing group and 20.55±7.21 hours after the surgery in the control group. Statistical reviews have shown that there were some significant differences between the three groups under study in terms of the times of the first bowel movement sound,

the first gas passage and the first defecation. In the investigations aimed at reviewing the time of discharge of mothers after cesarean section, it was observed that the mean discharge time was 46.88±6.03 hours after surgery in the misoprostol group, 47.33±5.14 hours after surgery in the gum-chewing group and 47.77±4.01 hours after surgery in the control group. As it can be seen, there was not a statistically significant difference between the three groups in terms of the mean time of discharge of the patients under study (Table 2).

In this study, some of the side effects of misoprostol were also examined. According to these examinations, 1.8% of mothers experienced fever, 0.9% of them had diarrhea and 0.9% of the mothers had nausea after taking misoprostol (Table 3).

Discussion

Misoprostol is a prostaglandin analogue E1 which is used for preventing peptic ulcer disease resulted from NSAID drugs.¹¹ In some studies, it has been observed that using this drug increases the movements in the gastrointestinal tract, which causes early bowel functions.¹²

In a research conducted by Shang *et al.*, the effect of gum-chewing on the time of

the first normal bowel sound was reviewed. They concluded that chewing gum significantly shortens the time of the first bowel movement.¹³ It can be seen that the results obtained from this study are compatible with the findings of the study of Shang *et al.* Furthermore, in another study conducted by Elkatten *et al.*, the effect of 200 and 400 micrograms of misoprostol on the first bowel sounds was reviewed. In this study, it was concluded that using misoprostol with these dosages does not affect the time of the first bowel movement sound.¹⁰ As it can be seen, the results of their study does not comply with the results of the present study, which can be associated with the fact that different dosages of misoprostol have been used in these two studies. In the research conducted by Elkatten *et al.*, the time of first gas passage was studied and a significant difference was observed between the misoprostol group and the control group.¹⁰

In the investigations aimed that reviewing the time of the first gas passage and the first defecation, it was observed that these occurrences took the shortest time for the patients in the misoprostol group, following them were the patients in the gum-chewing group and finally, they took the longest for the patients in the control group. KHI Abd-El-Maeboud conducted a study and reviewed the effect of gum-chewing on

Table 1. General characteristics of the mother's.

Variables	Misoprostol	Gum-chewing	Control	P-value
Age	26.38±4.22	26.53±4.18	27.06±3.12	0.405
BMI	26.63±1.98	26.83±1.33	26.42±1.64	0.630

Table 2. Resumption of bowel function in three groups.

Variables	Misoprostol	Gum-chewing	Control	P-value
First normal bowel sound (hour)	3.18±1.17	3.90±1.59	5.11±1.20	<0.001
First gas passage (hour)	6.23±1.35	7.35±2.34	9.76±2.42	<0.001
First defecation (hour)	14.59±5.29	16.34±6.05	20.55±7.21	<0.001
Discharge (hour)	46.88±6.03	47.33±5.14	47.77±4.01	0.446

Table 3. Side effects of Misoprostol.

	Misoprostol	Gum-chewing	Control
Fever	2 (1.8%)	0 (0%)	0 (0%)
Diarrhea	1 (0.9%)	0 (0%)	0 (0%)
Nausea	1 (0.9%)	0 (0%)	0 (0%)
Vomiting	0 (0.0%)	0 (0%)	0 (0%)
Other complaints	0 (0.0%)	0 (0%)	0 (0%)
None of them	104 (96.4%)	108 (100%)	108 (100%)

bowel movements and observed that gum-chewing significantly shortens the time of the first gas passage and the first defecation. Also, in this study, it was observed that the duration of hospitalization was significantly shortened for mothers who had recently underwent cesarean section.⁸ In general, it is clear that contradictory results have been found in different studies. These contradictions are indicative of the need for further studies in this field.

Examinations in this study have shown that there has been no significant difference between the time of discharge of the patients under study after C-section. In a study conducted by Craciunas *et al.*, it was also observed that chewing gum has not affected the duration of hospitalization of women who had underwent C-section.¹⁴

Furthermore, 4 of the patients studied in this research suffered from the side effects of taking misoprostol. Chewing gum stimulates the stomach, gastric secretion and digestive materials and acts as an artificial food which stimulates the gastrointestinal tract and begins its impact with this mechanism.^{7,9}

Conclusions

Given the results obtained from the present study, it can be concluded that taking misoprostol and chewing gum can significantly shorten the time of the beginning of bowel function (including the first normal bowel movement, first gas passage and first defecation) in mothers who had recently underwent cesarean section; but they have not had a significant impact on the duration of hospitalization of the mothers under study. These are all indicative of the

positive effects of using misoprostol and chewing gum on the intestinal function of patients and breastfeeding. In addition, the results also suggest that the effect of using misoprostol on the start of intestinal functions is more significant than the effect of chewing gum.

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