

Effect of Gum Chewing in the Reduction of Paralytic Ileus Following Cholecystectomy

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ABSTRACT

Paralytic ileus after abdominal surgery causes abdominal distention, pain, accumulation of gas, nausea and vomiting. Chewing gum can increase bowel movements and reduce the transient period of paralysis. The purpose of this study was to determine the effect of gum chewing in the reduction of paralytic ileus following cholecystectomy. This interventional study was conducted on 40 patients undergoing cholecystectomy in Jiroft University of Medical Sciences, 2012. After surgery, they were randomly allocated to intervention (gum chewing) and control groups. Patients in the intervention group chewed sugar free gum 3 times a day for an hour each time after full consciousness. The first bowel sounds, flatus passage and defecation were recorded in both groups. Data were analyzed using student T-test. The first gas passing was reported 21.05 ± 12.8 and 40.8 ± 15.9 hours following operation in intervention and control groups, respectively. The first defecation was occurred 38.1 ± 29.8 and 58.25 ± 18.6 hours after operation in intervention and control groups, respectively. The first bowel sounds were heard 4 ± 1.02 and 4.9 ± 1.3 hours post-operatively in intervention and control groups, respectively. In all three cases, the difference between two groups was statistically significant. With regard to the results, gum chewing is an inexpensive and useful approach that reduces paralytic ileus following cholecystectomy.

Keywords: Ileus, Cholecystectomy, Chewing Gum.

INTRODUCTION

Paralytic ileus is a basic disruption emerging after abdominal surgery and is defined as the delayed return of the coordinated intestinal motility. This disruption makes the improvement delayed and increases the hospital days of stay. The economic effects of this disruption are estimated as equal to 750 million to 1 billion USD in America. Apart from the economic issues, the patient's lack of comfortableness and other problems such as the hospital infections are very important¹⁻³. After most surgeries, the activity of the bowels is inhibited and this causes abdominal distention, accumulation of gas, nausea and

vomiting. Longer and wider abdominal surgery leads to more severity of this disruption⁴. Postoperative ileus occurs due to the reduction of intestinal activity and the lack of the activity of parasympathetic nervous system⁵. Up to now, several methods have been studied for the reduction of the Postoperative ileus period among which one can refer to use epidural anesthesia, the reduction of using narcotic perfusion by prescribing non-steroidal anti-inflammatory drugs (NSAIDS), laparoscopic surgery, and using high-carbohydrate drinks after the surgery⁶⁻⁷. One of the methods that have been recently noted by some researchers for reducing paralytic ileus is gum chewing. Gum chewing is a sort of fake feed

stimulating the digestion. This in turn causes the increase of the gastrin plasma concentration and pancreatic polypeptide and increases the duodenal alkali discharge and it can be effective on the reduction of paralytic ileus duration⁹⁻¹⁰.

The researches by Fitzgerald et al, Chan et al, and Marwah et al¹⁰⁻¹² showed the effects of gum chewing on the reduction of paralytic ileus. But Matros et al. and Quah et al¹³⁻¹⁴ failed to demonstrate the useful effect of the gum chewing after some surgeries. Thus it seems there is a disagreement between the researchers' findings. This research aims to study the effects of the gum chewing on the improvement of ileus after cholecystectomy surgery.

METHODS AND MATERIALS

This interventional study (based on the ethical code of K/90/135) was confirmed by the Ethical Regional Committee in the Research Center of Iranian Kerman University of Medical Sciences. Then it was conducted on 40 volunteer patients undergoing cholecystectomy surgery in Imam Khomeini Hospital of Jiroft in 2012. The

patients were randomly classified into two groups: intervention group (gum chewer) with 24 subjects, and control group with 26 subjects.

The subjects of the both groups were matched regarding the variables of the age and gender. The including criteria were the age +15 and the Cholecystectomy surgery in laparotomy method; and the excluding criteria were the diabetes record, abdominal surgery experience, hypothyroidism, electrolyte disorders, neuromuscular suffering, drug addiction, having dentures, and need for being hospitalized in ICU.

The patients of the both groups were anesthetized in similar method and were operated by the same surgeon. This research was conducted after informing the patients about the objectives and methods of the research and all patients participated in it voluntarily. Patients in the intervention group chewed sugar free gum (Orbit brand produced by Wrigley Company) 3 times a day for 20 minutes each time after full consciousness until the beginning of the oral intake. The bowel sounds of the both groups were recorded by a partner practitioner using

Table 1: Gender and educational level of the two groups of patients

Group Variable	Intervention		Control		
	Number	Percent	Number	Percent	
Gender	Male	12	50	14	45
	Female	12	50	12	55
Educational level	Illiterate	88	33.4	9	34.6
	elementary	5	20.8	8	30.8
	High school	7	29.1	6	23.1
	University	4	16.7	3	11.5

Table 2: Comparison of the mean of the two groups' intestinal indexes per hour

Group	Intervention	Control	Sig.
Variable			
Gas passing	21.05±12.8	40.8±15.9	P=0.001
Defection	38.1±29.8	58.25±18.6	P=0.002
Bowel sound hearing	4±0.02	1.9±1.2	P=0.096

stethoscope each 2 hours, and the time of the flatus passage and defecation of the both groups were recorded on the assessment form by a trained nurse. The practitioner and the nurse were not informed about the intervention and control groups. The collected data were analyzed using SPSS 15 and statistical t-test. The accepted significance level was considered as lower than 0.05.

The age average of the intervention group was equal to 56.6 ± 13.9 and the corresponding age average of the control group was equal to 56.2 ± 15.7 . There was no significant difference between the two groups of patients with regard to their age, gender, and educational level (Table 1).

The average time of hospital stay in the intervention and control group was equal to 3.1 ± 0.3 and 3.5 ± 0.5 days respectively. The results showed a statistically significant difference between the means of the gas passing duration, the means of the duration of defecation, and the means of the first bowel sound after the operation in the two groups of the patients (Table 2).

CONCLUSION

This research showed that chewing the sugar-free gum after cholecystectomy surgery will lead to the decrease of the gas passing, defecation, and bowel sound hearing time and indeed to the decrease of the paralytic ileus in the patients. This result is consistent with the results of several relevant studies¹⁵⁻¹⁹.

In their research, Purkayastha et al. showed that the return of the time of bowel sounds in the intervention group (gum chewers) occurs significantly sooner in comparison to the control group. This result is consistent with our findings²⁰.

In another research, Schuster et al. studied the effect of chewing gum in elective open sigmoid colectomy patients on the hearing the first intestinal sounds. They found that the first hearing of the bowel sounds in the intervention group was equal to 89.4

but the same time for the control group was equal to 65.4. Again this finding is consistent with our result²¹.

As mentioned before, the mean of the first hearing of the gas passing in the intervention and control groups was equal to 21.05 ± 12.8 and 40.8 ± 15.9 respectively; while this difference is significant statistically. This finding is consistent with the results of Ghafouri, et al., and Hirayama, et al; but it is inconsistent with the results of Quah, et al.^{3, 14, 22} The shorter time of the intestinal movement returns in the intervention group can be interpreted due to the mechanism of the gum performance¹². In our research the mean of the defecation time was recorded as sooner than the corresponding time of the control group. This piece of finding is consistent with researches by Hirayama et al. and Kouba et al.^{22, 23}; but it is not consistent with the studies by Matros et al. and Quah, et al.^{13, 14}

The results of this research showed that the hospital stay time in the intervention group was lower than the control group. De. Keller D, et al. showed that early feeding after the operation can reduce the duration of the hospital stay^{24, 25}. Moreover, the obtained results by King et al. and Soop et al. found that the gum chewing decreases the duration of the hospital stay after the surgery. Their results were consistent with our findings in this research^{26, 27}. Additionally, in their research, Vásquez et al. suggested chewing the gum as a standard treatment after the abdominal surgery²⁸. By and large, gum chewing will lead to the reduction of paralytic ileus following cholecystectomy and it can be used as inexpensive and useful method for the bowel stimulation.

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