Original Article

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The Enhanced Recovery After Surgery (ERAS) for Patients Undergoing Planned Abdomino-Pelvic Surgery: Recovering Bowel Motility and Reducing Length of Stay

Shagufta Parveen[1], Rubaba Abid Naqvi[2], Mahwash Jamil[3], Nabila Irum[4]

[1]Consultant Gynaecologist, [2]Associate Professor Obs/Gyn RTH RMU
[3]Associate Professor HITEC-IMS Taxila, [4]Consultant Gynaecologist UK

Author`s Contribution

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Address of Correspondent
Dr. Shagufta Parveen
Consultant Gynaecologist
drshaguftaparveen@gmail.com

ABSTRACT

Objective: To evaluate the effectiveness of chewing gum in improving paralytic ileus, shortening hospital stays, and enhancing satisfaction in patients undergoing planned abdomino-pelvic surgery.

Methodology: A quasi-experimental study with a non-equivalent groups design was conducted in the Obstetrics and Gynecology department of Rawalpindi Teaching Hospital from January 15, 2023, to July 15, 2023. One hundred and fifty eight patients were randomly assigned to two groups: Group A (gum chewing) and Group B (control), each containing 79 patients. Group A was instructed to chew gum for 15 minutes three times a day starting 6 hours after surgery. Group B received conservative management, commencing clear oral fluids after the passage of gas and transitioning to a soft diet after passing stool. The primary outcome measures included the time to first bowel sounds, passage of flatus, passage of stool, and length of hospital stay, while secondary outcome measures comprised nausea, vomiting, patient satisfaction, and abdominal distension.

Results: The average age in Group A was 48.6 ± 10.9, and in Group B it was 50.2 ± 13.7. The mean post-operative time (in hours) to audible bowel sounds in Group A and B was 49 (43-63) versus 61 (46-72), respectively (P=0.03); passage of flatus was 70 (50-83) versus 80 (67-110) (P=0.01); stool passage was (38.1 ± 29.8 versus 58.25 ± 18.6) (P=0.002); and hospital stay was 71 (56-89) versus 93 (75-118) (P<0.001).

Conclusion: Gum chewing after elective abdomino-pelvic surgery enhances post-operative recovery by promoting early bowel function and thereby reducing hospital stays.

Keywords: Abdomino-pelvic surgery, paralytic ileus, length of hospital stay.

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Introduction

Postoperative ileus (POI) refers to a transient halt in bowel function following surgery. This condition is marked by the absence of flatus and bowel movements for a period exceeding two days, accompanied by symptoms such as nausea, vomiting, and abdominal distension. Between 10% and 15% of patients who undergo gynecological surgery will experience POI. This is a temporary condition that usually resolves on its own within a few days. However, in some cases, it may require treatment. The factors that may increase the risk of POI after gynecological surgery include type complex surgeries, older age and patients with other health conditions, such as diabetes or heart disease, are more likely to experience POI. After most of abdomino-pelvic surgeries, coordinated bowel activity is delayed and suppressed leading to accumulation of gas, abdominal distention, nausea and vomiting. Severity of symptoms is directly related to longer and wider abdominal surgery.[1,2] Postoperative morbidity is increased as patients are unable to tolerate food due to nausea, vomiting, discomfort and these increase the risk of infection and hospital stay. [3,4,5]

POI, or postoperative ileus, is a common physiological response to abdominal surgery.[5] Treatment is generally supportive and includes intravenous fluids, keeping the stomach empty, and nasogastric suction. Several approaches have been studied for treating post-operative ileus, including epidural anesthesia, minimally invasive surgery, avoiding narcotic analgesics, and using non-steroidal anti-inflammatory drugs and carbohydrate drinks.[7] Gum chewing is another simple method that has been shown to stimulate the gastrointestinal system by increasing gastrin, pancreatic polypeptide, and alkali secretions in the small intestine.[8] Several studies have found that gum chewing can help to speed up the return of bowel movement and reduce the length of hospital stay after caesarean sections.[9,10]

The use of enhanced recovery pathways (ERPs) is growing in popularity for major planned open gynecological surgery. Early fluid intake is the only intervention that has been consistently used in all trials of ERPs. The basis of early feeding is that the act of eating triggers a reflex that stimulates regular bowel movements and the release of gastrointestinal hormones.[11] After an abdominal surgery, patients are typically kept on an empty stomach to prevent ileus and to decrease the risk of nausea, vomiting, and abdominal distension.[10]

There is some disagreement among researchers about the effectiveness of various interventions in improving patient outcomes after gynecological surgery.[13,14] This study aims to investigate the effects of gum chewing on the improvement of ileus following elective gynecological surgery. Specifically, the study will examine the role of gum chewing in reducing gastrointestinal side effects and the length of hospital stay after planned abdomino-pelvic surgeries.

Methodology

A quasi-experimental study was conducted following approval from the hospital's ethical committee, under the code [IERC/OBS/2023/]. A total of 158 patients were randomly assigned to two groups: group A (gum chewing) and group B (control), each consisting of 79 patients. In group A, patients were permitted to chew gum for 15 minutes three times a day, starting 6 hours post-surgery. Group B received conservative management, which entailed initiating clear oral fluids after passing gas and a soft diet after passing stool. The primary outcome measures included the time to first bowel sounds, passage of flatus, passage of stool, and length of hospital stay. Secondary outcome measures encompassed nausea, vomiting, patient satisfaction, and abdominal distension.

To achieve 90% power with a 4% margin of error, a sample size of 150 participants was determined using the WHO sample size calculator. Statistical analysis was conducted using SPSS version 22.

The inclusion criteria encompassed patients undergoing elective gynecological surgeries such as total abdominal hysterectomy, myomectomy, cystectomy, and vaginal hysterectomy. Exclusion criteria included patients who underwent laparoscopic surgeries, obstetrical hysterectomies, or had diabetes. Additionally, patients who were unwilling to participate were excluded. All patients received comprehensive information regarding the study's objectives and procedures before enrollment. Initially, 179 patients were selected for the study, but 21 refused to enroll. Subsequently, the remaining selected 158 patients were evenly divided into two groups, each comprising 79 participants.

After surgery, the patients were randomly assigned to two groups: Group A (gum chewing) and Group B (no gum chewing). In both groups, clear oral fluids were started after the passage of flatus and soft food after the bowel movement. In Group A, patients were allowed to start chewing gum 6 hours after surgery for 15 minutes at least three times a day until they started eating solid foods. The bowel sounds of both groups were checked every 2 hours for 5 minutes using a stethoscope. The time of first bowel sounds, the time of passage of flatus, and the time of passage of stool (defecation) were recorded for both groups on a pre-designed form. Normal bowel sounds, also known as gurgling or borborygmi, are the movement of gas and fluid through the intestines. All the durations were recorded in hours starting from the completion of surgery.

Paralytic ileus was defined as a combination of nausea, vomiting, and abdominal discomfort occurring within the first 12 hours post-surgery, along with abdominal distension exceeding 6 centimeters at the umbilicus level within 12 to 24 hours post-surgery. Abdominal distension was measured by recording the baseline abdominal girth immediately after surgery and then every 8 hours for all patients. Maternal satisfaction levels were assessed using a visual analogue scale, ranging from 0 (unsatisfied) to 10 (satisfied). Patients were discharged from the hospital upon achieving stability, tolerating oral intake, and remaining symptom-free for a minimum of 18 hours post-surgery. The length of hospital stay was calculated in hours from the time of surgery to the time of discharge.

Quantitative variables, such as age, length of hospital stay, time of return of bowel, and time of passage of flatus, were reported as mean and standard deviation. These variables were analyzed using a paired sample t-test. Qualitative variables, such as patient satisfaction, nausea, vomiting, and abdominal distension frequencies, were calculated and analyzed using a chi-square test. The collected data was analyzed using SPSS version 22.

Results

Elective abdomino-pelvic surgical procedures were performed in 158 patients. The procedures included abdominal hysterectomy (65%), cystectomy (16.4%), myomectomy (11.4%), and vaginal hysterectomy (7%). The average age of patients in group A was 48.6±10.9 years, and the average age of patients in group B was 47.2±13.7 years. All patients in group A tolerated gum chewing well Table I.

Table I: Demographic and clinical characteristics of the study participants. (n=79)

Parameter	Group A n(%)	Group B n(%)	Total n (%)
Age <45 years	27	24	51(32)
>45 years	52	55	107(68)
BMI <35	26	23	49(30)
>35	53	56	109(70)
Type of surgery			
Abdominal hysterectomy	46	53	99(63)
Cystectomy	15	11	26(16)
Myomectomy	11	7	18(13)
Vaginal hysterectomy	7	8	11(8)
Past abdomino-pelvic surgery			
Yes	41	38	79(50)
No	38	41	79(50)
Duration of surgery <2 hours	69	64	133(84)
>2 hours	10	15	25(16)

The mean time for patients in group A to hear their first bowel sounds, passing gas, and passing stool was significantly shorter than the mean time it took for patients in group B. The length of hospital stay was also significantly shorter in group A. (Table II).

Patient satisfaction is found to be more 71(89) in group A vs 54(68) group B (Figure 1). Whereas there were less cases of abdominal distension in gum chewing 27(34) vs 39(48) in no gum chewing (Figure 2).

Table II: Postoperative Outcomes of the two groups.

Primary Outcome measures: median IQR	Group A	Group B	P-value
Time of bowel movement hour	49 (43-63)	61 (46-72)	0.03
Time of passage of first flatus hour	70 (50-83)	80 (67-110)	0.01
Time of first liquids hour	26 (18-40)	30 (21-41)	0.14
Time for first solids hour	59 (52-68)	69 (64-93)	0.01
Time of stool passage hour	38 (31-47))	58 (50-64)	0.002
Length of hospital stay hour	71 (56-89)	93 (75-118)	<0.001
***Secondary outcome measures: mean + SD**			
Episodes of nausea	53±21	62±24	0.30
Episodes of vomiting	28±36	25±29	0.48

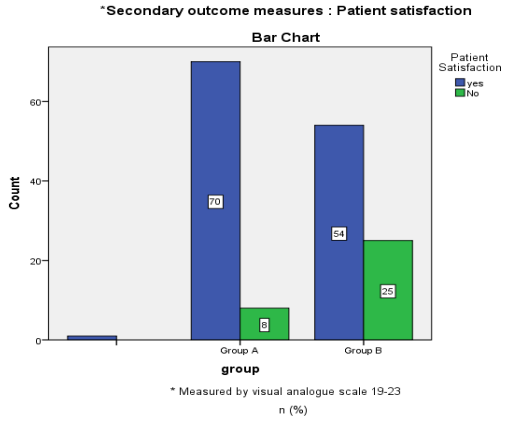

Figure 1. Comparison of Patient satisfaction in both groups.

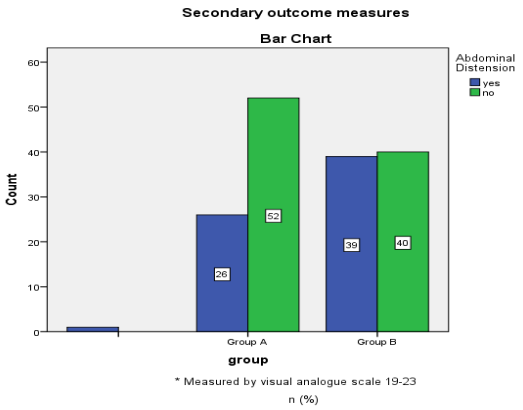

Figure 2. Comparison of Abdominal distension in both groups.

Discussion

Paralytic ileus is a common postoperative complication that can lead to nausea, vomiting, discomfort, and prolonged hospital stay. Gum chewing (Fake food) has been shown to improve bowel function after surgery and shorten the time to passage of flatus. According to our

findings in the gum chewing group the time of hearing first bowel movement and time of passage of first flatus is 10-11 hours earlier than non-gum chewing group. Varadhan et al. [17] found that the time it took for patients in the intervention group to hear their first bowel sounds was 65.4 hours. For patients in the control group, it took 79.4 hours, which is 14 hours longer. Passage of flatus is a clinical sign that bowel function is recovering. It is also a prerequisite for regular food intake after surgery. Our results are consistent with other studies, such as those by Hansberger CR[18], Purkayastha et al. [19], and Elroy Patrick [20], which have shown that gum chewing after cesarean sections, open colostomies, gynecological and laparoscopic surgeries is associated with a shorter time to passage of flatus and reduced abdominal cramping.

Other studies have also shown that gum chewing after open cholecystectomy surgery can reduce paralytic ileus by decreasing the time it takes for patients to pass gas, have a bowel movement, and regain bowel motility.[15-19] This is consistent with the findings of several other studies, including those by Schuster [21], Fitzgerald ,[22] Chan [23], and Marwah[24], which have shown that gum chewing can help patients recover bowel function after elective open sigmoid colectomy surgery.

While Matros et al. [25] and Quah et al. [26] did not find evidence that gum chewing was beneficial for paralytic ileus, other studies, such as that by Pilevarzadeh et al. [27] have shown that gum chewing can have several advantages after surgery, including an earlier return of bowel sounds, a faster recovery, and a shorter hospital stay. The findings of our study showed that the gum chewing (fake food) group started early initiation of oral fluids which was associated with a shorter length of hospital stay. These results are comparable to a study by CMH Okara[28,29] in which one group started oral fluid intake as early as 2 hours after cesarean delivery, while the other group began oral fluid intake as early as 12 hours after cesarean delivery. Hospital stay was shorter in the early feeding group (19 ± 12 hours) than in the late feeding group (29 ± 6.7 hours; P = 0.03).

In our study, the gum chewing group had a mean time of passage of gas that was 10 hours earlier than the non-gum chewing group. This finding is consistent with the results of other studies, such as those by Ghafouri et al. [30] and Zeeshan H K [31] However, it is inconsistent with the results of Quah et al. [26]

In our study, the mean time to passage of stool was 20 hours earlier in the gum chewing group (38 hours) than in the non-gum chewing group (58 hours). This finding is consistent with the results of other studies, such as those by Ghafouri et al. [30] and Zeeshan H K.[31] However, it is inconsistent with the results[32] of Saad AF et al. [33] and Quah et al. [26], which found no difference in the time to passage of stool between gum chewing and non-gum chewing groups.

Our study found that the length of hospital stay was shorter in the gum chewing group (71 hours) than in the non-gum chewing group (93 hours). This finding is consistent with the results of other studies, such as those by De. Keller et al. [34] and Soop and Lee MJ. [35,36] These studies suggest that early feeding and gum chewing can both help to reduce the duration of hospital stay after surgery.

Secondary outcome measures, such as the number of episodes of nausea, vomiting, and abdominal distension, were lower in the gum chewing group (group A) than in the non-gum chewing group (group B). However, the difference was not statistically significant.

Gum chewing can help to reduce the discomfort of paralytic ileus, a common complication of abdominal surgery. It is a low-cost and effective intervention [37] that can be used to prevent or treat paralytic ileus. Both our study and the study by Vásquez W[38] found that gum chewing can be an effective way to prevent paralytic ileus after abdominal surgery.

Limitation: More studies are required to find the role of chewing gum in the patients in whom gut injury, repair and extensive adhesiolysis is done during emergency obstetrical and gynecological surgeries.

Conclusion

Gum chewing after elective abdomino-pelvic surgery enhances post-operative recovery by early return of bowel functions and significantly reduces the length of hospital stay.

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