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Enhanced Recovery after Planned Gynaecological Surgery: A Study on Gut Motility and Hospital Stay

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ABSTRACT

Objective: To evaluate the effectiveness of chewing gum in ameliorating post-operative ileus, reducing hospital stay and improving patient satisfaction after planned gynecological surgery.

Study Design: Quasi-experimental study.

Place and Duration of Study: Combined Military Hospital Kharian, Pakistan from Aug 2022 to Mar 2024.

Methodology: The quasi-experimental study was conducted on a total of 400 patients satisfying the inclusion criteria. Patients were divided into two groups. Group-A had 243 patients while group-B had 157 patients. Patients in the group-A were made to start chewing gum 8 hours post surgery for 15 minutes thrice a day, whereas group-B did not chew any chewing gum. The outcome measures were time to first bowel sounds, passage of flatus, bowel opening, nausea, vomiting, abdominal distension, length of hospital stay and patient satisfaction.

Results: Mean age of patients in groups A and B was 44.0 and 40.0 years respectively. The median time to first audible gut sounds and passage of flatus in group-A were 19.0(17.0-22.0) and 24.0(23.0-28.0) hours versus 23.0(21.0-24.0) and 28.0(27.0-28.5) hours in group-B, $p \leq 0.001$. Mean time of first liquid intake and bowel opening in group-A was 28.0(28.0-31.0) and 40.0(37.0-42.0) hours as opposed 31.0 (30.0-42.0) and 44.0(42.0-48.0) hours in group-B, $p \leq 0.001$. Mean length of hospital stay in group-A and B was 44.0(42.0-46.0) and 52.0(47.0-56.0) hours with a p-value ≤0.001. There was significantly less nausea and improved patient satisfaction in group-A.

Conclusion: Gum chewing following surgery enhances post-operative Bowel function recovery, patient satisfaction and shortens hospital stay.

Keywords: gynaecological surgery, length of hospital stay, post-operative ileus,

How to Cite This Article: *Saleem U, Arif N. Enhanced Recovery After Planned Gynaecological Surgery: A Study On Gut Motility and Hospital Stay. Pak Armed Forces Med J 2024; 74(6): 1654-1658. DOI: https://doi.org/10.51253/pafmj.v74i6.11982*

INTRODUCTION

Enhanced Recovery after Surgery (ERAS) protocols have reestablished the perspective of preoperative care with refined patient outcomes, diminished complications and accelerated recovery following surgical interventions.[1] These protocols have achieved extensive recognition over several surgical specialties. Emphasizing no prolonged fasting and introducing carb loading strategies not only mitigate the risk of postoperative nausea and vomiting (PONV) but also promote better recovery.[2] Opting for no bowel prep enhances overall satisfaction with the surgical experience.[3] Intra-operative optimal fluid management, hemodynamic stability,[4] use of short acting anesthetics and regional anesthesia facilitates a quicker recovery.[5] Use of opioid sparing anesthesia reduces the risk of opioid related complications post-surgery.[6] Employing small incisions and avoiding drains minimize tissue trauma and accelerate healing.[7] Maintaining normothermia throughout the procedure helps prevent post-operative complications.[8] Moreover, VTE and antibiotic prophylaxis are essential measures to reduce the risk of thromboembolic events and surgical site infections, respectively, enhancing patient safety and recovery.[9-10] In the post-operative phase prioritizing early oral nutrition, optimal fluid management and use of non-opioid analgesia strategies prevents PONV. Post-operatively nausea vomiting is a distressing and troublesome symptom which negatively affects the patient's surgical experience.

Nonetheless the categorical influence on gut motility and hospital stay after elective abdomino-pelvic surgery continues to be a matter of current investigation.[10] Gut motility plays a crucial role in the post-operative recovery process, as impaired gastrointestinal function can lead to post-operative ileus with an incidence of 10-30% after abdominal surgery[13] and 10-15% after gynaecological surgery. Restricting solids by no more than 6 hours and liquids

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Received: 31 Mar 2024; revision received: 03 Jun 2024; accepted: 04 Jun 2024

2 hours prior to surgery along with use of coffee and chewing gum in post-operative period have been shown to have a preventive role.[10]

Research evaluating the role of gum chewing is available from the field of colorectal surgery, gastrointestinal surgery and gynecological oncology. Its role in post cesarean has also been studied extensively, however, data from elective gynecological surgery is somewhat lacking. Against this backdrop, our study seeks to evaluate the effectiveness of chewing gum as an adjunct therapy in enhancing recovery outcomes following planned gynecological surgery. By rigorously assessing its impact on post-operative ileus resolution, length of hospital stay and patient satisfaction this research aims to elucidate the role of chewing gum within the context of ERAS protocols and contribute to the growing body of evidence encouraging their use in gynecological surgical care.

METHODOLOGY

This quasi- experimental study with was carried out at Department of Obstetrics and Gynaecology, Combined Military Hospital Kharian from August 2022 to March 2024. Hospital Ethical Committee Approval was obtained via letter no A/24/05 dated 1st February 2024. Sample size was calculated using online sample size calculator; a minimum of 139 patients in each group were required.[11]

Inclusion Criteria: All patients undergoing elective gynecological surgery including abdominal hysterectomy, ovarian cystectomy, myomectomy and vaginal hysterectomy were included in the study.

Exclusion Criteria: Patients undergoing laproscopic surgery, having co-morbid conditions like diabetes mellitus, hypertension, ischemic heart disease, suspected or confirmed malignancy and those who were undergoing emergency surgery were excluded.

A total of 400 patients satisfying the inclusion criteria were recruited using non-probability convenience sampling method. They were randomly divided into two non-equivalent groups with a bias against the control group to allow for more patients to undergo the intervention. Group A and B comprised of 243 and 157 participants respectively (Figure). None of the participants underwent bowel preparation. Wherever possible regional anesthesia was employed. All patients received prophylactic antibiotics, H2 antagonists, nonopioid analgesics, anti-emetics and thromboprophylaxis following surgery. Around 3 to 3.5-liter intravenous fluid was administrated over 24 hours post operatively. Vital signs were recorded half hourly for first two hours followed by every four hours for the next 24 hours. All patients received prophylactic glycerine suppositories on first post operative day.

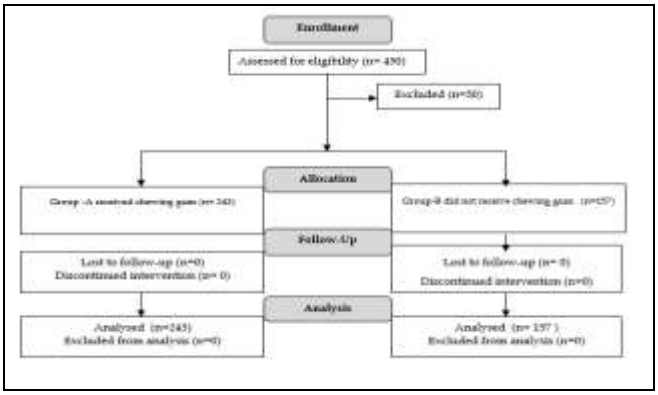

Figure: Patient Flow Diagram (n=400)

Group-A (n=243) was instructed to chew gum 6 hours post-surgery for 15 minutes thrice a day, whereas group-B was managed expectantly i.e. they were allowed clear oral fluids after passage of flatus. The outcome measures were time to first bowel sounds, passage of flatus, liquid intake, solid intake, bowel opening and length of hospital stay. Occurrence of nausea, vomiting, abdominal distension and patient satisfaction were also noted. A stethoscope was used by resident doctor to record bowel sounds every two hours, starting 6 hours after surgery. All time durations were noted in hours. The baseline abdominal girth was noted immediately after surgery and then measured every 12 hours. Abdominal distension was defined as an increase of >6cm in baseline abdominal girth at the level of umbilicus. Patient satisfaction was gauged using Visual Analogue Scale (score 0-5=satisfied, 6-10=unsatisfied). The patients were discharged when they were heamodynamically stable, self-mobilized out of bed and taking and tolerating orally. All outcomes were documented in a predesigned proforma.

Data was analyzed using Statistical Package for Social Sciences (SPSS) 22.00. Normality of data was checked by using Kolmogorov-Smirnov test. Data were not distributed normally (i.e Age, BMI, time of first bowel movement, passage of flatus, liquid intake, solid intake, bowel opening, hospital stay) and were represented using median (IQR). Qualitative data was represented by using percentage and frequency. Chi square test (for qualitative variables), Mann Whittney

U-test (for non-normal quantitative data) were applied and a *p*-value of ≤ 0.05 was considered statistically significant.

RESULTS

Four hundred (n=400) patients undergoing elective gynaecological surgery were included in this study. Their median age and body mass index (BMI) were 42.50(47.00 -34.00) years and 27.00(28.00-26.00) kg/m² respectively. Patients were divided into two groups, 243(60.8%) in group-A and 157(39.9%) in group-B. Median age was 44.00(47.00-35.00) years in group-A versus 40.00(48.00-30.00) years in group-B (*p*=0.095). Moreover, median of BMI was 27.00(27.00-25.00)kg/m² in group-A versus 27.00(28.00-26.00) kg/m² in group-B (*p*< 0.001). (Table-1)

Majority of the patients had abdominal hysterectomy in both groups 52.7% and 37.6% respectively. 59(37.6%) patients in group-B underwent myomectomy as compared to group-A 41(16.9%) the *p* value was <0.001. Duration of surgery was more in group-B as compared to group-A with the *p* value of <0.001. However, mostly patients of both groups had history of past abdominopelvic surgery (*p*= 0.219). The patients of group-B had more episodes of nausea and vomiting than group-A (54.1% vs 19.8%, 22.9% vs 13.9%) *p*<0.001 and 0.021 respectively. Both the groups had no abdominal distension. Patients of group-A (94.2%) were more satisfied as compared to group-B (51.0%) as depicted by the *p* value of < 0.001. (Table-ll)

The median time of first bowel movement was 19.00(22.00-17.00) hours in group-A versus 23.0 (24.00-21.00) hours in group-B (*p*<0.001) which is statistically significant. Similarly, the median time of first passage of flatus in group-A was significantly less than group-B i.e. 24.00(28.00-23.00) hours versus 28.00(28.50-27.00) hours with a *p* value <0.001. Median time of first liquid and solid intake were more in group-B as compared to group-A (*p*<0.001). Furthermore, median time of first bowel opening 40.00(42.00-37.00) hours in group-A versus 44.00(48.00-42.00) hours in group-B (*p*<0.001). Moreover, length of hospital stay was increased in group-B as compared to group-A, *p*<0.001 (Table-lll).

Table-I Demographic variables of Both Groups (n=400)

Variables	Group-A(n=243)	Group-B(n=157)	*p*-value
Median age(years)	44.00 (47.00-35.00)	40.00 (48.00-30.00)	0.095
Median BMI(kg/m²)	27.00 (27.00-25.00)	27.00 (48.00-30.00)	<0.001

Table-II: Comparison of Gynaecological Surgeries Between Both Groups (n=400)

Variables	Group-A (n=243)	Group-B (n=157)	*p*-value
Surgery			
Abdominal Hysterectomy	128(52.7%)	59(37.6%)	<0.001
Ovarian Cystectomy	63(25.9%)	27(17.2%)	
Myomectomy	41(16.9%)	59(37.6%)	
Vaginal Hysterectomy	11(4.5%)	12(7.6%)	
Duration of Surgery			
< 2 hours	229(94.2%)	128(82.2%)	<0.001
>2 hours	14(5.8%)	28(17.8%)	
Past abdominopelvic surgery			
Yes	131(53.9%)	74(47.1%)	0.219
No	112(46,1%)	83(52.9%)	
Episodes of Nausea			
Yes	48(19.8%)	85(54.1%)	<0.001
No	195(80.2%)	72(45.9%)	
Episodes of vomiting			
Yes	33(13.6%)	36(22.9%)	0.021
No	210(86.4%)	121(77.1%)	
Abdominal distension			
Yes	1(0.4%)	1(0.6%)	1.00
No	242(99.6%)	156(99.4%)	
Patient Satisfaction			
Yes	229(94.2%)	80(51.0%)	<0.001
No	14(5.8%)	77(49.0%)	

Table-III: Comparison Of Bowel Functions And Hospital Stay Among Both Groups (N=400)

Variables	Group-A(n=243)	Group-B(n=157)	*p*-value
Time of first bowel movement(hours)	19.00 (22.00-17.00)	23.00 (24.00-21.00)	<0.001
Time of first passage of flatus(hours)	24.00 (28.00-23.00)	28.00 (28.50-27.00)	<0.001
Time of first liquid intake(hours)	28.00 (31.00-28.00)	31.00 (34.00-30.00)	<0.001
Time of first solid intake(hours)	32.00 (35.00-31.00)	38.00 (39.00-34.00)	<0.001
Time of first bowel opening(hours)	40.00 (42.00-37.00)	44.00 (48.00-42.00)	<0.001
Length of hospital stay(hours)	44.00 (46.00-42.00)	52.00 (56.00-47.00)	<0.001

DISCUSSION

Our study is an addition to the growing body of scientific literature advocating the use of ERAS[12-16] protocols in gynecological surgery while studying the possible role of chewing gum towards improving outcomes. Contrary to our findings, a Nigerian study[17] published in 2023 did not report any benefit of

gum chewing on post-operative ileus after abdominal surgery. Although like our study, there was shorter hospital stay, albeit statistically insignificant.

A systematic review[18] of randomized controlled trials published between 2000 and 2022, found that compared to routine care, chewing gum by post-operative gynecological cancer patients reduced the incidence of ileus (p=0.0006), time to first passage of flatus (p=0.0006), time to first bowel movement (p=0.02) and length of hospital stay (p<0.00001) . These results corroborate our findings. This study advocates an additional benefit of early solid intake in post operative patients. A randomized controlled Trial conducted in Ireland by Bowe *et al.*,[19] studied the effect of chewing gum in reducing post-operative ileus leading to nausea vomiting, in patients undergoing elective cesarean section under regional anesthesia. Similar to the findings in this study, no improvement was seen in episodes of vomiting. However, as opposed to this study no reduction in nausea was noticed (p<0.001 Vs p=0.461).

ERAS® Society Guidelines for post-operative care in gynecological/oncology surgery recommend considering chewing gum for prevention of post-operative ileus (moderate evidence).[20] Our findings argue the same. A recent randomized controlled trial from Thailand[21] evaluated the efficacy of post-operative gum chewing on the recovery of gastrointestinal functions after surgical staging of gynecological cancer. In line with the findings of this study, it showed statistically significant reduction in time to first passage of flatus 24.0 vs 24.7 hours and shorter hospital stay p<0.001 vs 0.023. Unlike this study, no significant difference in time to first bowel sound, time to first defecation and ileus symptoms was noted in this trial.

A meta-analysis published in 2018[22] aimed at studying the evidence for reduced ileus with gum chewing following gynecologic surgery. The results showed that gum chewing was beneficial with reduction in time to first flatus, time to first defecation and hospital stay. This is in agreement with our results. Also a systematic literature review and meta-analysis from China concluded that chewing gum improved bowel functions and reduced post-operative complication after gynecological surgery.[23] It showed a reduced time to return of gut sounds, first aero Fluxus and bowel opening. Also, the incidence of nausea, vomiting and post-operative ileus was lower than the group of standard care. Similar to our study the duration of hospital stay was also decreased.[23]

CONCLUSION

Use of chewing gum enhances post-operative recovery of bowel functions after gynecologic surgery. This simple, inexpensive intervention may help in reducing the troublesome and distressing symptoms of post-operative nausea vomiting which translates into improved patient satisfaction and reduced hospital stay.

Conflict of Interest: None.

Funding Source: None.

Authors' Contribution:

The Following authors have made substantial contributions to the manuscript as under:

US & NA: Conception, study design, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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