

# Effect of Gum Chewing on Postoperative Ileus in Patients Undergoing Gastrointestinal Surgery

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## ABSTRACT

**Objective** To assess the effect of chewing gum on paralytic gut in postoperative period among patients who underwent gastrointestinal (GI) surgeries.

**Study design** Experimental study.

**Place & Duration of study** Department of General Surgery ward-26, Jinnah Postgraduate Medical Center (JPMC) Karachi, From March 2016 to August 2016.

**Methodology** Patients who underwent GI surgery in emergency were included. Patients were enrolled via non probability consecutive sampling. Study protocol and procedure were explained and informed consent taken. Two groups, group A and B were made by lottery method. Both groups received standard postoperative care. Group A patients were advised to chew gum six hours after surgery, four times a day. First passage of flatus, bowel opening and time to discharge were recorded. Hospital stay was measured from the time of operation to time of discharge. Data was entered and analyzed by using SPSS version 17.0.

**Results** Total of 60 patients were included in this study. Age of the patients ranged from 20-60 years. Age and sex stratification was done. Significant difference was observed between two groups irrespective of age and sex on the resumption of gut function assessed by passage of flatus and stool in favor of group A. Time to discharge from hospital was also reduced in the patients of group A.

**Conclusions** This study showed that return of bowel function after GI surgery was early in patients who chewed gum postoperatively. This is a safe and cost effective method to avoid long postoperative ileus, improve gut motility and reduce hospital stay.

**Key words** Chewing gum, Gastrointestinal surgery, Postoperative ileus.

## INTRODUCTION:

Postoperative ileus (POI) is an evitable and common sequel of major abdominal surgery. Transient inhibition of normal peristaltic activity of gastrointestinal track, typically lasting for 3 to 4 days after surgery, is defined as postoperative ileus.<sup>1</sup> It has multi-factorial pathophysiology which is poorly understood. It can lead to significant morbidity

in terms of delay in postoperative recovery, and long hospital stay.<sup>2</sup>

All parts of gastrointestinal track are affected by POI to varying degrees. Small intestine is the first to recover its functions, usually within first 24 hours, followed by stomach in about 24 to 48 hours and usually it takes 48 to 72 hours for large intestine to regain its function.<sup>3</sup> POI, usually not considered life threatening but is harmful and uncomfortable for the patient. Nausea, vomiting, abdominal distension, postoperative pain, absent gut sounds, lack of passage of flatus and stool, delay in resumption of enteral feeding and prolonged hospitalization are the characteristics of POI. Other considerable complications include deconditioning, malnutrition,

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increased chance of hospital acquired infections and deep vein thrombosis leading to impaired patient satisfaction and add to economic burden.<sup>3</sup>

Standardized postoperative care for POI has been supportive including gastric decompression by nasogastric tube, nil per orum, need of analgesia and intravenous fluid administration till the resumption of function of gut in terms of passage of flatus and opening of the bowel. An active approach can bring bowel motility sooner. To shorten the duration of POI, many pharmacologic and non pharmacologic strategies have been applied including changes in the surgical techniques, supportive care, pharmacological intervention, early oral feeding, avoidance of Ryle's tube and early mobilization to enhance gut function, reduce morbidity and shorten hospital stay.

With the advent of enhanced patient recovery protocols researchers have focused on newer treatments to combat the major causes of delayed discharge. Based on these, sham feeding is a technique to enhance bowel motility. Gum chewing, a form of sham feeding, provides the advantage of bowel excitation preventing the problems combined with feeding.<sup>2,3</sup> An RCT study conducted in China on chewing gum to reduce POI after GI surgery found favorable outcome which was statistically significant for gum chewing group.<sup>4</sup> This study was designed to find out whether gum chewing would play a role in minimizing the economic burden on patients in terms of early recovery and early discharge.

#### METHODOLOGY:

This was an experimental study conducted in the Department of General Surgery ward-26, Jinnah Postgraduate Medical Center Karachi, from March

2016 to September 2016. All patients between 20 and 60 year of age, admitted through emergency department requiring gastrointestinal surgery, were included in this study. Patients admitted with perforated duodenal or gastric ulcers, those having recent myocardial infarction and stroke, metastatic disease and previous abdominal radiation, and subject requiring postoperative mechanical ventilation, were excluded from the study.

Two groups A and B were made by lottery method. Group A was advised to chew gum six hours after surgery, four times a day along with standardized postoperative care and group B was only given standardized postoperative care. First passage of flatus and bowel opening were recorded postoperatively. Time to discharge was also noted.

Data was entered and analyzed through SPSS version 17. Mean and standard deviation were calculated for; time taken to passage of flatus and bowel opening (in hours) and duration of hospital stay was recorded. Stratification with respect to age and gender was also done. Post-stratification Student t test was applied and p value <0.05 was taken as significant.

#### RESULTS:

Total of 60 patients were included in this study, 30 in each group. The age of patients ranged from 20- 60 years. The mean age of the patients was 29.97+7.97 year in chewing gum group and without chewing gum group 30.23+9.20 year. Female to male ratio was 1:1.5. Significant difference was observed in time to pass first flatus (p<0.000), time to first bowel opening (p<0.000) and length of hospital stay in days (p<0.000) between two groups, as shown in table I.

| <b>Table I: Comparison of Variables Between Two Groups</b> |             |           |                |
|--|-------------|-----------|----------------|
| <b>Mean Time to Pass First Flatus (Hour)</b>               |             |           |                |
| <b>Groups</b>  | <b>Mean</b> | <b>SD</b> | <b>P-value</b> |
| Chewing gum  | 9           | 3         | <0.001         |
| Without chewing gum  | 17.54       | 7.148     |                |
| <b>Mean Time to First Bowel Movement (Hour)</b>            |             |           |                |
| Chewing gum  | 11.373      | 4.57      | <0.001         |
| Without chewing gum  | 25.25       | 8.5       |                |
| <b>Mean Length of Hospital Stay (Days)</b>                 |             |           |                |
| Chewing gum  | 1.97        | 0.414     | <0.001         |
| Without chewing gum  | 3.67        | 0.711     |                |

**DISCUSSION:**

Postoperative ileus is common feature that develops after abdominal surgeries, leads to delayed recovery and time to discharge from hospital. Spinal, local sympathetic neural reflexes, and inflammatory mediators released during surgery as normal stress response, contribute to the pathophysiology behind ileus.<sup>5</sup> Surgeons have tried to find ways to shorten this period. Usual methods for prevention of ileus include postoperative bowel rest and gastric decompression. These methods, have however proved ineffective and unnecessary and even increased morbidity in some cases.<sup>6</sup> Park et al conducted a similar study and his results favored mean time of passage of flatus duration of hospital stay to shorter in the study group contrast to the control.<sup>7</sup>

In recent past, a study by Dutch researchers evaluated the response of chewing gum on post-surgical ileus and time to discharge from hospital. Result concluded that 27% of patients enrolled to chewing gum group developed ileus compared to 48% of patients admitted in the control group (P=0.02). The study strongly favored chewing gum and found to be safe and simple treatment of choice to decrease POI.<sup>8</sup> Duk et al reached to a similar conclusion. They performed the study on patients undergoing laparoscopic colorectal cancer surgery and result revealed the decreased length of postoperative hospital stay in the gum-chewing group.<sup>9</sup> Sanjay et al did this study aimed to evaluate chewing gum effect on the duration of postoperative ileus following small bowel anastomosis and found distinctive perk in the study group.<sup>10</sup> The positive results were also reported in other series.<sup>11-14</sup>

The presumed mechanism of action is cephalic-vagal stimulation of gastrointestinal track, similar to oral intake but avoiding risk of vomiting and aspiration, giving rise to propulsive and hormonal activity related to bowel movement that resulted in early resumption of gut activity leading to early appetite and passage of flatus. Index study was intended to observe the effectiveness of chewing gum on gut motility among patients going through GI surgery. Findings were consistent with other studies and clearly favored the experimental group. Post-surgery chewing of gum was effortless, secure and economical way to enhance the recovery of patients who underwent GI surgery.

**CONCLUSIONS:**

Mean duration to pass first flatus, opening of bowel and hospital stay were shorter in the chewing group. Chewing gum proved to be easy, secure and

economical technique to improve the outcome in patients undergoing GI surgery.

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Received for publication: 28-11-2017

Accepted after revision: 30-09-2018

Author's Contributions:

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Conflict of Interest:

The authors declare that they have no conflict of interest.

Source of Funding:

None

How to cite this article:

Mumtaz A, Ghansham, Azam H, Hyder Z, Panhwar W. Effect of gum chewing on postoperative ileus in Patients undergoing gastrointestinal surgery. *J Surg Pakistan.* 2017;23(3):95-98. Doi:10.21699/jsp.23.3.4.