



INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact factor: 4.295

(Volume 4, Issue 3)

Available online at: www.ijarjit.com

Effectiveness of chewing gum exercise upon gut motility among patients after open abdominal surgery

Jaslina Gnanarani J.

jasbas12@gmail.com

Apollo College of Nursing, Chennai,
Tamil Nadu

Lis Maria Mathew

lismelettu@yahoo.com

Apollo College of Nursing, Chennai,
Tamil Nadu

Dr. Latha Venkatesan

latha6901@yahoo.com

Apollo College of Nursing, Chennai,
Tamil Nadu

ABSTRACT

Postoperative patients often develop Paralytic Ileus which complicates their recovery. This study was conducted to assess the effectiveness of chewing gum upon gut motility among patients after open abdominal Surgery Methods: This study was conducted using a quasi-experimental, posttest only design at a selected Hospital, Chennai. The study samples (60) were selected using simple random sampling and assigned to control (30) and experimental (30) groups randomly. Data was collected using Gastrointestinal resumption indicator to assess gut motility. Results: Majority of the patients undergoing open abdominal surgery received general anesthesia (93.3, 93.3%), had NG tube (70%, 76.6%), epidural analgesia for pain relief (66.6%, 83.3%). Non-gastric disease (63.3%, 63.3%), undergone non-gastric surgeries (63.3%, 63.3%) and had received opioids for pain management (63.3%, 63.3%) in control and experimental group respectively. The duration of time for the return of bowel sounds was less in the experimental group (Mean: 8+3.7) when compared to the control group (Mean: 14+5.03 with a "t" value of 5.5 ($p < 0.001$)). Factors such as Gastric Surgery, the presence of NG tube, non-opioid pain medication had an association with earlier return of gut motility in patients after open abdominal surgery. Chewing gum exercise may be recommended for all postoperative patients after open abdominal surgery.

Keywords: Gastric Motility, Abdominal surgery, Chewing gum

1. BACKGROUND

The most important goal for nurses caring for patients undergoing surgery is an uneventful postoperative period and complete recovery. An important determinant of an extended length of hospitalization following abdominal surgery is postoperative Ileus (POI). It is a temporary impairment of Gastrointestinal motility in which a part of the intestine becomes paralyzed and does not function properly.¹ Probable mechanisms for POI include disruption of the sympathetic and Parasympathetic pathways to the GI tract, inflammatory changes mediated over multiple pathways, use of opioids, pain, spinal and supraspinal adrenergic and non-adrenergic pathways activated in the acute postoperative period.²

The small intestine recovers the normal function first, usually within the first 24 hours, followed by the stomach about 12-24 hours later; and recovery of the normal large intestine function usually takes between 48 - 72 hours. If POI lasts longer than 3 days, it is thought to be complicated and may be termed as postoperative paralytic Ileus.³ The symptoms of POI include nausea, vomiting, abdominal distension and tenderness, delayed passage of flatus and stool. Prevention of POI will improve patients comfort, shorten the length of hospital stay, limits the cost and prevention of infection.

Management strategies for POI include prevention and supportive care. Many research studies have looked into avoiding the use of routine NG intubation, early ambulation, early oral feeding, and use of prokinetic agents and avoidance of narcotic agents to shorten POI and hasten discharge. Chewing gum is a type of gum made of chicle, a natural latex product, or synthetic rubber known as poly-isobutylene. Chewing gum works by modulating the input to the cephalic-vagal afferent pathways, and increases gastric motility and dampens the inhibitory effects of sympathetic afferent pathways.⁴ Chewing gum boosts mental power reduces stress and tension, helps in weight reduction, and improves oral health. Interestingly, gum chewing has also recently shown to alleviate negative mood and decrease cortisol levels during acute psychological stress.⁵

Around 40% of patients undergoing laparotomy experience prolonged Ileus.⁶ Radical cystectomy is also associated with a high rate of Ileus, seen in 17% of patients. Approximately 2.9% of patients undergoing total abdominal hysterectomy develop POI.⁷

In Asia, around 2-4% of cases were reported to develop postoperative Ileus after abdominal surgeries.⁸ Among the gastro intestinal complications after renal transplantation, around 58% cases reported prolonged Ileus in India.¹⁰ It prolongs hospital stay, increases medical costs and frustrates patients and healthcare professionals. So alleviating the incidence of POI is very essential in all the aspects.¹

Placement of NG tube for decompression may alleviate symptoms of POI once they occur. Drugs such as Metaclopramide, a dopamine antagonist, and cholinergic agonist, do not have a much beneficial effect on gut motility in most randomized controlled trials.¹¹ Interventions such as early oral or enteral feeding are associated with potential complications compared to chewing gum which has multiple benefits like oral hygiene, stress reduction etc.

Cavusoglu (2008) conducted a study to evaluate whether gum chewing prevents the onset of postoperative paralytic Ileus in children with anastomosis as an additional standardized treatment and was found to have the earlier return of bowel function and discharge from the hospital.¹² A systematic review and meta-analysis on the effectiveness of gum chewing on prevention of postoperative Ileus following elective intestinal surgery were conducted by Noble et al. (2009), using nine eligible trials that had enrolled 437 patients. Estimates showed a reduction in time to flatus by 14 hrs; time to bowel movement by 23h; and a reduction in length of hospital stay by 1.1 days.¹³

Rob. (2007) led a study on the effectiveness of chewing gum exercise on reduction of Ileus in 34 patients after open elective sigmoid colectomy. The first passage of flatus occurred on (65.4h, 80.2h), first bowel movement on (63.2h, 89.4h), the first feeling of hunger occurred on (63.5h, 72.8h) and length of hospital stay (4.3days, 6.8 days) in the gum-chewing group and control group.¹⁴

Five randomized control trials among 158 patients were conducted by Shan. (2007), to find out the use of chewing gum in reduction of Postoperative Ileus. Gum chewing patients passed flatus 24.3% earlier (weighted mean difference, -20.8 hours; $p = 0.0006$) and had bowel movement 32.7% earlier (weighted mean difference, -33.3 hours; $p = 0.0002$) and discharged 17.6% earlier than those had ordinary postoperative treatment.¹⁵

We need to incorporate recent evidence in order to reduce the incidence of complications due to surgery, hospital stay and costs. In India, only very few studies have evaluated the effectiveness of chewing gum exercise upon gut motility among patients after open abdominal surgery which shows the need for more studies in this realm. The use of chewing gum is an uncomplicated inexpensive but highly effective intervention.

2. STATEMENT OF THE PROBLEM

A study to assess the effectiveness of chewing gum exercise upon gut motility among patients after open abdominal surgery

The objective of the Study

To assess the effectiveness of chewing gum exercise by comparing the return of gut motility between control and an experimental group of patients after open abdominal surgery.

Null Hypothesis

There will be no difference in the return of gut motility between control and an experimental group of patients after open abdominal surgery.

3. MATERIALS AND METHODS

A quasi-experimental post-test only design was adopted for conducting this study. The study was conducted in the selected Hospitals, Chennai as the physical setting with a minimum of 10 abdominal surgeries, including open and laparoscopic approach. The study was approved by the Institutional Ethical committee and setting permission was obtained. Sixty patients who underwent open abdominal surgery and those who are fully conscious, oriented, and able to follow instructions were selected by purposive sampling. Patients with a history of the large intestine and rectal surgery, Unconscious patients, oral lesions and allergy to mint were excluded from the study. Informed consent was obtained. Confidentiality and was assured. Among them, 30 were randomized to the experimental group and 30 were randomized to the control group. The experimental group was given the intervention and control group received routine care.

The data was collected by observation method using instruments such as demographic variable proforma, clinical variable proforma, gastro-Intestinal resumption indicator¹⁶ and rating scale on the level of satisfaction of patients. The score was given as first at 6 hours after surgery and every two hourly scores on two parameters such as the return of bowel sounds and passage of flatus. The score of < 34 indicated absence of gut motility; Score of 18 – 34 partial return of gut motility: Score < 17 indicated the complete return of gut motility. The study was limited to patients undergoing open abdominal surgery only, during the particular period of data collection and the concerned setting.

Intervention Protocol

Researcher assessed the bowel sounds and passage of flatus before administering chewing gum. Then one stick of sugar-free chewing gum (extra spearmint) was administered for 30 minutes, four times a day (morning, afternoon, evening, night) was done till the passage of flatus.

4. FINDINGS & DISCUSSION

Demographic Characteristics of patient after open abdominal surgery

In this study majority of the patients after open abdominal surgery were graduates (93.3%, 90%), married (90%, 83.3%), more than 50 years (63.3%, 63.3%), males (60%, 66.6%), employed (53.3%, 53.3%), monthly income of more than Rs30, 000/ month (60%, 60%) and Hindus (56.6%, 53.3%) in the control and experimental group respectively.

Table 1: Clinical Variable of Patients after Open Abdominal Surgery.

Clinical variables	Control Group n=30		Experimental Group n=30	
	n	P	N	P
BMI				
Below 20	17	56.6	2	6.6
20-25	11	33.3	15	50
Above 25	2	6.6	13	43.3
Dietary habits				
Vegetarian	6	20	8	26.6
Non Vegetarian	24	80	22	73.3
History of Co-morbid Conditions				
Present	12	40	15	50
Absent	18	60	15	50
History of Constipation				
Yes	14	46.6	11	36.6
No	16	53.3	19	63.3
History of Use of Laxative				
Yes	12	40	9	30
No	18	60	21	70
Type of Anesthesia				
General	28	93.3	28	93.3
Spinal	2	6.6	2	6.6
Presence of NG Tube				
Yes	24	80	23	76.6
No	6	20	7	23.3
Use of Pain Medication				
Non Opioids	11	36.6	11	36.6
Opioids	19	63.3	19	63.3
Route of Pain Medication				
Intravenous	9	30	6	20
Epidural	21	70	24	80

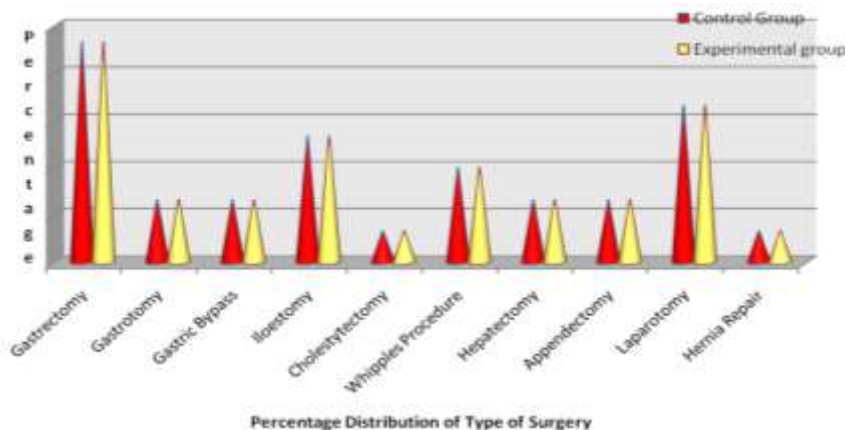


Fig. 1: Clinical Variables of Patients after Open Abdominal surgery

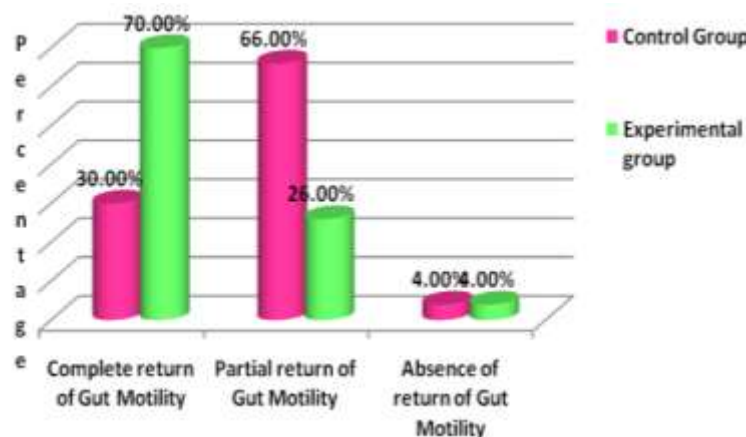


Fig. 2: Frequency and percentage distribution on the return of gut motility after chewing gum exercise among patients after open abdominal surgery.

Most of the patients (66%) had resumed partial return of gut motility between 24 to 48 hrs in the control group whereas in experimental group majority of the patients (70%) had resumed complete gut motility within 24 hrs after surgery. According to Marwah (2012), sham feeding (when food is smelled or chewed not swallowed) demonstrated as one of the methods to increase bowel motility earlier. So chewing gum exercise found to be an effective method to prevent the occurrence of Postoperative Ileus.
17

Table 2: Effectiveness of Chewing Gum Exercise on Return of Gut Motility among Patients after Open Abdominal Surgery.

	Control Group		Experimental Group		“t” value
	Mean	S.D	Mean	S.D	
Bowel Sounds	14	5.03	8	3.7	5.5***
Passage of Flatus	21	5.1	15	3.96	5.45***

*** p <0.001

The duration of time for the return of bowel sounds was less in the experimental group (Mean=8; S.D=3.7) when compared to the control group (Mean=14; S.D=5.03) with “t” value of 5.5 at p < 0.001. The time taken for passage of flatus of experimental group (Mean 15± 3.96) was less than that in the control group (Mean 21± 5.1) with “t” value of 5.45 at p < 0.001 and hence the null hypothesis H₀1, “There will be no difference in the return of gut motility between control and experimental group of patients ” was rejected. The findings were consistent with that of a study conducted by Yen (2013), found that the time was shorter for passage of flatus (2.4 versus 2.9 days) and bowel movement was significantly reduced (3.2 versus 3.9 days) in patients who received chewing gum compared with controls.¹⁸

Level of Satisfaction on Chewing Gum Exercise among Patients after Open Abdominal Surgery.

Almost all the patients felt and expressed that the chewing gum was appropriate, useful, relaxes and promotes comfort. Harma. (2009), found that gum-chewing shortened postoperative Ileus in experimental group when compared with control group. They found that it was cheap, simple, safe and a stress reliever and enhanced oral hygiene.¹⁹

Influence of Selected Demographic and Clinical Variable and Return of Gut Motility

The findings suggested that patient aged 50 yrs and above had delayed the return of gut motility ($\chi^2 = 5.01$ at p<0.05) in the control group and experimental group of patients after open abdominal surgery. Some of the clinical variables like gastric surgeries ($\chi^2=8.6$ at p<0.01), the presence of NG tube ($\chi^2=5.83$ and 5.64 at p<0.05), nonopioid pain medication ($\chi^2 =9.89, 7.39$ at p<0.01) enhanced the early return of gut motility in patients after open abdominal surgery. Bonventre (2014), who conducted a study on the effectiveness of sugar-free chewing gum extrapolated that gut surgeries like liver resection, small bowel resection etc had a longer duration of Ileus compared to other surgeries.³

5. CONCLUSION

Nurses should follow protocol for assessing the gut motility and take initiative for early feeding, mobilization, and exercises. Nursing professionals should conduct further collaborative research including various alternative methods for paralytic Ileus.

No Funding Received. No Conflict Of Interest received.

6. REFERENCES

[1] Nimrata, N. (2013). The effectiveness of chewing gum on bowel motility among patients who have undergone abdominal surgery. *Nursing and Midwifery Research Journal*, 12(7), 112-130. 85

[2] Vather R, Bissett IP. Risk factors for the development of prolonged postoperative ileus following elective colorectal surgery. *Int. J. Colorectal Dis.* 2013;1-73.

[3] Bonventre S, Inviati A, Di Paola V, Morreale P, Di Giovanni S, Di Carlo P, Schifano D, Frazzetta G, Gulotta G, Scerrino G. Evaluating the efficacy of current treatments for reducing postoperative ileus: a randomized clinical trial in a single center. *Minerva Chir.* 2014; 69:47–55.

[4] Fitzgerald, J. (2009). A systematic review of chewing gum therapy in the reduction of postoperative paralytic Ileus following gastrointestinal surgery. *World Journal of Surgery*, 23 (57), 2557-2566.

[5] Basaran, M. et al. (2009). Gum chewing to prevent postoperative Ileus. *Anatolian Journal of Obstetrics and Gynaecology*, 1 (2), 1-3.

[6] Delaney, C. P. et al. (2004). Clinical perspective on postoperative Ileus and effects of opiates. *Neuro Gastroenterology Model*, 16(7), 61-66.

[7] Wolff, Bruce G. et al. Patterns of Gastrointestinal Recovery after Bowel Resection and Total Abdominal Hysterectomy: Pooled Results from the Placebo Arms of Alvimopan Phase III North American Clinical Trials. *Jn of the American College of Surgeons*, Volume 205, Issue 1, 43 - 51

[8] Burt Cagir, Postoperative Ileus, and Management, emedicine.medscape.com/article/2242141-2006. 9.Stern RM, Crawford HE, Stewart WR, Vasey MW, Koch KL. Sham feeding. Cephalic-vagal influences on gastric myoelectric activity. *Dig Dis Sci* 1989; 34: 521-527

[9] Singh KJ, Srivastava A, Suri A, Srivastava A, Dubey D, Kapoor R, Kumar A. Gastrointestinal complications in renal transplantation. *Indian J Urol* 2004;20:33-5

- [10] Seta, M.L. & Kale-Pradhan, P.B. (2001) Efficacy of Metoclopramide in Postoperative Ileus After Exploratory Laparotomy, *Pharmacotherapy*, Vol.21, pp. 1181-1186.
- [11] Cavusoglu, Y. (2009). Does chewing gum exercise reduce postoperative Ileus after intestinal resection in children? *European Journal of Paediatrics and Surgery*, 19(3), 171-173.
- [12] Noble, E. (2009). Gum chewing reduces postoperative Ileus. *International Journal of Surgery*, 43(6), 100-105.
- [13] Rob, A. et al. (2007). The effectiveness of chewing gum exercises upon reduction of Ileus after open sigmoid colectomy. *Journal of Gastroenterology*, 38(4), 167-172.
- [14] Chan MK1, Law WL. Use of chewing gum in reducing postoperative ileus after elective colorectal resection: a systematic review. *Dis Colon Rectum*. 2007 Dec;50(12):2149-57.
- [15] Massey, R. L. (2012). Return of bowel sounds indicating an end of Postoperative Ileus. *World Journal of Gastroenterology*, 25(8), 223-226.
- [16] Marwah, S. et al. (2012). Role of chewing gum exercise on the duration of postoperative Ileus following ileostomy closure. *Saudi Journal of Gastroenterology*, 18(2), 111-117.
- [17] Yen, Z. (2013). Gum chewing another simple potential method for more rapid improvement of postoperative GI function. *World Journal of Digestion*, 87(2), 195-199.
- [18] Harma, M. (2009). Gum chewing speeds return of first bowel sounds but not the first defecation after caesarean section. *Anatol Journal of Obstetrics and Gynaecology*, 11(3), 21-25.