International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 14, No. 1, January 2025 Online ISSN: 2250-3137
Print ISSN: 2977-0122

DOI: 10.69605/ijlbpr_14.1.2025.64

ORIGINAL RESEARCH

A prospective study of factors impacting the return of bowel activity following exploratory laparotomy

[1]Dr. Himanshu Lambora, [2]Dr. Avi Gupta, [3]Dr. Ajay Kumar Choudhary, [4]Karan Singh Virdi, [5]Dr. Money Gupta

[1,2,3]Junior Resident, National Institute of Medical Sciences & Research, Jaipur, Rajasthan, India
[4]National Institute of Medical Sciences & Research, Jaipur, Rajasthan, India
[5]Professor, Department of General Surgery, National Institute of Medical Sciences & Research, Jaipur, Rajasthan, India

Corresponding Author
Dr. Money Gupta
Professor, Department of General Surgery, National Institute of Medical Sciences & Research, Jaipur, Rajasthan, India
Email: drmoney_surgeon@yahoo.com

Received: 10 December, 2024 Accepted: 29 December, 2024 Published: 22 January, 2025

ABSTRACT

Background: Normal abdominal functions are momentarily stopped after abdominal surgery. Postoperative ileus (POI), defined by slowing of gastrointestinal motility, has a negative influence on patients' recovery by delaying hospital release and causing discomfort and agony. The objective of this prospective research is to determine the prevalence of POI and evaluate the risk factors that contribute to its development. **Methods:** Patients who had surgery at NIMS, Jaipur were included in this hospital-based prospective research. A consistent proforma was used to gather data, which included pertinent clinical history, pre-operative tests, and post-operative examinations. Descriptive statistics, t-tests, nonparametric tests, chi-square tests, and multivariate logistic regression analysis were all used in the statistical study. **Results:** In this research, men (59.03%) outnumbered women (40.96%). In comparison to men (89.79%), ladies (91.17%) had earlier onset of bowel motility. Stoma (p=0.001), peritoneal contamination (p=0.001), higher preoperative hemoglobin (p=0.009), duration of surgery (p=0.005), and postoperative chloride (p=0.001) were factors that were substantially linked with POI in the univariate analysis. The research revealed no statistically significant differences in the restoration of bowel function after taking into account a number of variables, including age, sex, history of prior surgery, history of comorbidity and blood transfusions. **Conclusion:** This research advises patients after laparotomies to start oral intake rather than listen for bowel sounds, since the latter may be helpful even in the local resumption of bowel movement.

Keywords: Intestines, Postoperative Ileus, Risk Factors, Bowel Function.

INTRODUCTION

A crucial component of the human digestive system is the intestines, which are made up of the small and large intestines. These organs, which make up over 90% of the digestive system's length and surface area, are critical for nutrition absorption, water balance, and the assimilation of vital micronutrients. As a result, they considerably aid in the development and healthy operation of the human body. Any bowel-related illnesses that impact patients' health and ability to function might compromise the body's delicate balance, underscoring the need of prompt treatment and correction of these problems.[1]

The regular operations of the abdomen are momentarily suspended during abdominal surgery in order to assist the operation. However, the surgeon's main objective is to promptly return abdominal functions to their regular course. The passage of flatus, which acts as a gauge of bowel function, is one of the crucial processes affected before and after abdominal surgery.[2] Laparotomies, a surgical technique that is often carried out in both emergency and elective situations, are linked to significant death rates. It is known to impede gastrointestinal motility, which might result in postoperative ileus (POI), a clinical condition. Patients who have abdominal surgery are greatly affected by this condition's postoperative course, which results in discomfort, agony, and a delayed hospital release. Abdominal distension, nausea, vomiting, stomach pains, and the lack of bowel noises are all signs of POI. Postoperative ileus is characterized by uncoordinated

DOI: 10.69605/ijlbpr_14.1.2025.64

intestinal action and decreased peristalsis, with patients displaying a spectrum of symptoms, from asymptomatic to cramping, bloating, and abdominal discomfort.[3] Patients work to reclaim their independence and resume their regular life throughout the postoperative recovery phase, which is a dynamic process. Physical function restoration is an important part of this rehabilitation, although it is often out of the person's control. Major abdominal surgeries, as expected, result in postoperative GI (gastrointestinal) tract dysfunction, while infrequently, lesser surgical procedures may also result in comparable problems. Postoperative ileus may develop as a result of large incisions, intensive gastrointestinal manipulation, and irritation of the peritoneum.[4] Following surgery, the restoration of intestinal motility has a fairly regular path, with small intestine motor activity returning within 5–10 hours, stomach motor activity recovering more slowly (24–48 hours), and colonic motility resuming on postoperative days 3–5. The resolution of postoperative ileus is often constrained by the restoration of colonic motor function.[5] The purpose of this prospective research is to look at the frequency of postoperative ileus as a sign of bowel motility failure in people having abdominal surgery. We will also evaluate the impact of several risk variables linked to the development and incidence of postoperative ileus. We want to use the information we gather to further our knowledge of the disorder and maybe create methods for its treatment and prevention.[6] It is essential to comprehend the occurrence and risk variables of postoperative ileus in order to enhance patient outcomes, lessen complications, cut down on hospital stays, and save money on medical treatment. We want to improve surgical treatment and encourage a quicker recovery for patients following abdominal procedures by raising awareness of this frequent complication.[7]

AIM AND OBJECTIVES

1. To look at the frequency of postoperative ileus as a sign of bowel motility failure in people having abdominal surgery.
2. To evaluate the impact of several risk variables linked to the development and incidence of postoperative ileus.

MATERIALS AND METHODS

After receiving the ethics committee's clearance and the patients' informed agreement, this research was carried out.

Source of data: Hospitalized patients who was undertaken for surgery in the Department of General Surgery at NIMS, Jaipur

Type of Study: Hospital based Prospective Study.

Sample size: Sample size was calculated using the formula.

$n= 4pq/L^2$

Where n is the sample size, q is the statistic corresponding to level of confidence, P is expected prevalence, and L is precision (corresponding to effect size). This comes out to be 83

Methods of Data Collection

The patient's pertinent clinical history, including any important prior illnesses, pre-operative investigations, and post-operative investigations, were used to gather the data using a specifically constructed, standardized proforma.

Inclusion criteria

1. Patient age >18 years old.
2. Patients who had both elective and emergency laparotomies

Exclusion criteria

1. Subjects with cognitive impairment and pregnant women.
2. Patients that are immunocompromised.

Factors studied

In this study the various factors studied were as follow.

1. Pre-operative factors
- Age and sex
– Diabetes, heart disease, and kidney disease are co-morbidities.
– Hemoglobin, albumin, renal function (blood urea, serum creatinine), and electrolytes are biochemical markers.
2. Intra operative factors
- Intraoperative variables that are patient-related include.
- Depending on the etiology: gangrene, cancer, and trauma
– Intraoperative variables connected to the surgeon include:
1. Surgery type
2. Length of the procedure
3. dealing with bowels

Post-operative factors:

1. Post-operative variables (biochemical parameter) from days 0 to 5 were recorded, as well as bowel sound, the first day of a flatus or motion, the existence and length of a protracted POI, the incidence of additional difficulties, and the length of stay.
2. Blood and blood product transfusions.

Statistical Analysis

Mean, standard deviation, and range were used in the research to characterize continuous variables. Categorical variables were shown as percentages and absolute values. The t-test or nonparametric test (Mann-Whitney test), if appropriate, was employed to compare the quantitative data. Depending on the situation, either the Chi-square test or the Fisher's exact test was used to analyze proportions. All analyses employed two-tailed P values, with a significance level of P 0.05 being regarded as

DOI: 10.69605/ijlbpr_14.1.2025.64

statistically significant. A multivariate logistic regression analysis included variables that had a P value of less than 0.05 and shown a connection with postoperative ileus (POI). Variables were excluded from the regression analysis one at a time, beginning with the one with the highest P value (P0.05 was deemed significant).

RESULTS

In two groups, Group BS I, which represented patients who had bowel sound within 48 hours, and Group BS II, which represented patients who experienced bowel sound beyond 48 hours, the research examined the occurrence of bowel sound. Only 8 patients (9.36%) of the entire 83 patients were in Group BS II, whereas 75 patients (90.36%) belonged to Group BS I. According to these results, the majority of patients resumed having bowel movements within the first 48 hours after surgery.

In two groups, Group FI (patients who passed flatus within 72 hours) and Group FII (patients who passed flatus after more than 72 hours), the transit of intestinal flatus was evaluated in the research. A total of 70 patients were included; 40 (57.14%) belonged to Group FI, and 30 (42.85%) to Group FII. According to these results, the majority of patients were able to pass flatus within the first 72 hours after surgery.

The research looked at the passage of motion in two groups: Group M I, which represented patients who passed motion in less than five days, and Group M II, who required more than five days. A total of 70 patients were included; 19 (27.16%) belonged to Group M I, and 51 (72.84%) to Group M II. According to these findings, the majority of patients needed longer than 5 days following surgery before passing motion.

Bowel sound, flatus, and motion were the three factors that the research used to compare elective and emergency procedures. No statistically significant differences were found between the two groups for any of these characteristics, according to the data.

Table No. 1: Distribution of the patients studied according to appearance of bowel sound.

BOWEL SOUND	APPEARANCE OF BOWEL SOUND	NO. OF PATIENTS
GROUP BS I	<48 hrs	75 (90.36%)
GROUP BS II	>48 hrs	08 (9.36%)
TOTAL		83

Table No. 2: Distribution of the patients studied according to passage of flatus.

BOWEL FLATUS	PASSAGE OF FLATUS	NO. OF PATIENTS
GROUP FI	Within 72 hrs	40 (57.14%)
GROUP FII	More than 72 hrs	30 (42.85%)
TOTAL		70

Table No. 3: Distribution of patients studied according to passage of motion.

MOTION	PASSAGE OF MOTION	NO. OF PATIENTS
GROUP M I	Within 5 days	19 (27.16%)
GROUP M II	More than 5 days	51 (72.84%)
TOTAL		70

Table No. 4: Correlation of bowel motility with type of surgery in the present study.

TYPE OF SURGERY			p value
	ELECTIVE	EMERGENCY	
BOWEL SOUND			
GROUP BS I	37 (86%)	38 (95%)	0.167
GROUP BS II	06 (14%)	02 (5%)	
TOTAL (83)	43	40	
BOWEL FLATUS			
GROUP F I	24 (60%)	16 (53.3%)	0.576
GROUP F II	16 (40%)	14 (46.7%)	
TOTAL (70)	40	30	
MOTION			
GROUP M I	8 (20%)	11 (36.6%)	0.120
GROUP M II	32 (80%)	19 (63.4%)	
TOTAL (70)	40	30	

DISCUSSION

The current research focused on the appearance of bowel sound, the passage offlatus, and motion in order to assess the recovery of bowel function after surgery. The research population included 83 patients who had exploratory laparotomy surgery at NIMS

DOI: 10.69605/ijlbpr_14.1.2025.64

Department of General Surgery in Jaipur between June 2021 and September 2022, both as elective and emergency procedures.[8] The results of related research are supported by the fact that the majority of patients in this study (59.03%) were men. However, compared to men, female patients made up a larger percentage (56.07%) in one research. The patients' age distribution revealed that patients between the ages of 30 and 60 made up the majority (63.85%), followed by patients above the age of 60 (19.27%) and those between the ages of 18 and 29 (16.86%). These results are consistent with earlier research that revealed a comparable age distribution among surgical patients. The correlation between intestinal motility and age varied amongst research, with some detecting a substantial correlation and others not.[9] In terms of the kind of operation, the study sample was composed of somewhat more patients (51.8%) who received elective procedures compared to patients (48.19%) who experienced emergency surgeries. There were no statistically significant variations in bowel sound, bowel flatus, or motion between elective and emergency procedures. Concerning the relationship between the kind of operation and the restoration of bowel function, comparable research have produced contradictory findings.[10] The findings of this research revealed that the majority of patients (90.36%) returned to having bowel sound within 48 hours following operation, while a lesser percentage (9.64%) did so beyond that time. The majority of patients (57.14%) passed intestinal flatus within 72 hours, whereas a lesser percentage of patients (42.85%) needed more than 72 hours. In addition, the majority of patients (72.84%) required more than 5 days to regain mobility following surgery. These results are in keeping with earlier research' findings of comparable recovery times for gastrointestinal function.[11]

Between the elective and emergency surgery groups, there were no statistically significant variations in bowel sound, bowel flatus, or motion, according to the research. Compared to the emergency group, the elective group had somewhat greater percentages of patients with bowel sound, intestinal flatus, and normal motion, but these differences were not statistically significant. These findings imply that the kind of surgery may not have an impact on when bowel function will resume.[12]

The research revealed no statistically significant differences in the restoration of bowel function after taking into account a number of variables, including age, sex, history of prior surgery, history of comorbidity, stoma, blood transfusions, and length of operation. The complexity of intestinal motility following surgery is shown by studies that found relationships between these variables and the length of postoperative ileus.[13]

The results of this research add to the body of knowledge already available on the restoration of bowel function after surgery. It's crucial to remember that this research has certain restrictions. First off, the sample size was rather small, which would restrict how broadly the results can be applied. The research was carried out at a single center, which could have introduced bias. The variables affecting the recovery of bowel function after surgery need to be further investigated in future research, which should include bigger sample numbers and multi-center designs[14].

CONCLUSION

This research focused on bowel sound, flatus passage, and motion to examine the recovery of bowel function after surgery. The majority of patients passed flatus within 72 hours, suggesting rapid recovery, and most had a restoration of bowel sound within 48 hours. However, mobility took longer, often requiring more than 5 days for most patients. The time of bowel function recovery was not substantially impacted by the kind of operation (elective or emergency). Potential implications on bowel activity include things like the length of the procedure, contamination, the existence of stomas, blood transfusions, preoperative hemoglobin, and postoperative chloride levels. As bowel sounds alone may not adequately indicate regional bowel activity, the research suggests considering flatus passage as a signal for starting oral intake after laparotomy. For optimal care and improved recovery regimens, it is crucial to comprehend the restoration of bowel function. To confirm these results and investigate other variables influencing the recovery of bowel function following surgery, more research with bigger sample numbers and multi-center designs is required.

REFERENCES

1. Herbst, T., Engl, T., Schlotterbeck, H., Bickel, A., Weigand, M. A., & Brenner, T. (2019). Intestinal function monitoring in the intensive care unit: A prospective, observational study. World journal of gastrointestinal pathophysiology, 10(2): 16-26.
2. Voron, T., Dariel, A., & Czernichow, S. (2020). Postoperative Ileus. In StatPearls [Internet]. StatPearls Publishing.
3. Soltani, E., Sayadipour, A., Najafizadeh, K., Mahmoudi, M., Mehrvarz, S., & Shirvani, M. (2018). Evaluation of Postoperative Ileus After Elective Abdominal Surgery in Shahid Sadoughi Hospital in 2015. Journal of Medical Sciences, 28(4): 243-247.
4. Waseem, H., Khan, K., D'Souza, H., & Hakim, S. Y. (2020). Postoperative Ileus. In StatPearls [Internet]. StatPearls Publishing.
5. Oh, C., & Divino, C. M. (2018). Bowel function after surgery. Clinics in colon and rectal surgery, 31(4): 214-221.
6. Vather, R., Trivedi, S., Bissett, I. P., & Development and validation of a risk stratification tool for postoperative ileus following major colorectal surgery. (2015). Annals of surgery, 262(1): 107-114.
7. Luckey, A., Livingston, E., Taché, Y., & Mechanisms and treatment of postoperative ileus. (2003). Archives of surgery, 138(2): 206-214.
8. Senagore AJ. Pathogenesis and clinical and economic consequences of postoperative ileus. Am J Health Syst

DOI: 10.69605/ijlbpr_14.1.2025.64

Pharm, 2007 Oct 1; 64(19 Suppl 13): S3-7. doi: 10.2146/ajhp070403.

9. Livingston EH, Passaro EP Jr. Postoperative ileus. Dig Dis Sci, 1990 Jan; 35(1): 121-32. doi: 10.1007/BF01536618.
10. Díaz-Tartera HO, Lobo-Machín Y, Acosta-Méndez Y. Factors associated with postoperative ileus after elective colorectal surgery: a systematic review and meta-analysis. Int J Colorectal Dis, 2019 Sep; 34(9): 1473-1489. doi: 10.1007/s00384-019-03363-y.
11. Jang HJ, Han KS, Yoon YS, Cho MS, Chun JM, Jo HJ, Oh JH. Factors associated with postoperative ileus after laparoscopic right colectomy for colon cancer. Int J Colorectal Dis, 2014 Feb; 29(2): 209-15. doi: 10.1007/s00384-013-1795-0.
12. Fawcett WJ, Shandall A, Tibbs CJ, Zorab JA. Abdominal wall mechanoreceptors and postoperative ileus. Br J Surg, 1981 Jun; 68(6): 384-6. doi: 10.1002/bjs.1800680612.
13. Vather R, Bissett IP, Hider P. Bowel recovery after colorectal surgery: Results of an international survey. Colorectal Dis, 2012 Sep; 14(9): e530-4. doi: 10.1111/j.1463-1318.2012.03029.x.
14. Miller G, Boman J, Shrier I, Gordon PH. Etiology of septic complications following colon surgery. Dis Colon Rectum, 2007 Nov; 50(11): 1979-86. doi: 10.1007/s10350-007-9074-5.