

## Frequency of Postoperative Ileus Following Exploratory Laparotomy at Tertiary Care Hospital

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(Received, 30<sup>th</sup> April 2025, Accepted 10<sup>th</sup> May 2025, Published 30<sup>th</sup> June 2025)

**Abstract:** Postoperative ileus (POI) is a common complication following abdominal surgery, particularly exploratory laparotomy, and is associated with increased morbidity, prolonged hospitalization, and higher healthcare costs. Early identification of its frequency and associated risk factors is essential to improve surgical outcomes. **Objective:** To find out the frequency of postoperative ileus following exploratory laparotomy. **Methods:** This study was conducted on 149 patients aged 18 to 60 years who underwent exploratory laparotomy in the General Surgery Department, Mardan Medical Complex, Mardan, from 29-01-2025 to 29-04-2025. Patients with pneumonia, thyroid dysfunction, and those presenting with pregnancy were excluded. Postoperative ileus was assessed in all patients, defined clinically by abdominal distension, absence of flatus or bowel movements, nausea or vomiting, and absent bowel sounds within 5 days after surgery. Data analysis was performed using SPSS 25. **Results:** The mean age of patients was  $42.28 \pm 13.24$  years. The majority were male patients (55.7%). The postoperative ileus rate in this study was 13 (8.7%). The study observed a significant association of postoperative ileus with prolonged hospital stay ( $p = 0.01$ ) and prolonged surgery duration ( $p = 0.02$ ). **Conclusion:** Postoperative ileus was developed in 8.7% patients following exploratory laparotomy. Prolonged operative time and prolonged hospital stay were significantly associated with postoperative ileus.

**Keywords:** Postoperative ileus, Exploratory laparotomy, Surgical complication, Operative duration, Hospital stay

**[How to Cite:** Bilal M, Khan A, Rehman WU, Ali F, Nisar SM. Frequency of postoperative ileus following exploratory laparotomy at a tertiary care hospital. *Biol. Clin. Sci. Res. J.*, 2025; 6(6): 717-720. doi: <https://doi.org/10.54112/bcsrj.v6i6.2174>

### Introduction

The term laparotomy is derived from Greek with lapara meaning “flank” and tomy meaning “cut.” It refers to a major incision made in the abdominal wall to gain access to the peritoneal cavity. A laparotomy comprises a midline incision along the linea alba, providing ideal exposure for an extensive range of intra-abdominal procedures. Historically, this procedure has been executed commonly with an estimated annual volume of 30,000 to 50,000 cases (1-3). However, the indications for laparotomy have decreased in the past few years, chiefly due to the advent of minimally invasive techniques such as laparoscopy. Despite this, surgical access remains a critical factor, as certain cases present challenges that make keyhole methods unfeasible, especially when vital structures are at risk of injury (4, 5).

An exploratory laparotomy is explicitly performed to inspect the abdominal organs for diagnostic or therapeutic determinations when less invasive approaches like imaging fail to classify the fundamental problem. It is typically considered a last resort procedure when a patient presents with medical signs suggestive of a critical abdominal condition (6, 7). One of the most challenging complications following the laparotomy is postoperative ileus (POI), which signifies a temporary interruption of normal bowel activity following the abdominal surgery. Patients with such a condition usually experience abdominal distension, vomiting, inability to pass gas, and absent bowel sounds. The development of ileus is frequent following the laparotomy due to direct manipulation of intestines while undergoing surgery, which temporarily disrupts coordinated contractions of the gastrointestinal tract and may extend postoperative recovery (8-10). A study reported that the incidence of postoperative ileus following exploratory laparotomy 25.5%, highlighting its importance as a postoperative complication (11). Diagnosis of postoperative ileus is primarily clinical, based on the patient's symptoms and auscultation findings. Imaging may be used to rule out other causes of abdominal discomfort, such as mechanical bowel obstruction or hernia (12, 13).

Postoperative ileus following the exploratory laparotomy is a serious complication that often results in extended hospital stays and slower recovery times. Despite progress in surgical methods and postoperative management, postoperative ileus continues to pose a significant challenge. As no such study is available locally on this subject, this study aims to determine the frequency of postoperative ileus following exploratory laparotomy at our hospital. The findings of this study will help our medical professionals address underlying mechanisms and assess the impact of various perioperative strategies; this research may contribute to more effective management of postoperative ileus and, eventually, improve patient care following exploratory laparotomy.

### Methodology

This descriptive study was conducted in the General Surgery Department, Mardan Medical Complex, Mardan, from 29-01-2025 to 29-04-2025 after taking ethical approval from the institute's ethical review board. The study's sample size was 149, calculated using the WHO sample size calculator, based on a previous frequency of ileus after exploratory laparotomy of 25.5% (11), a 95% confidence level, and an absolute precision of 7%. A consecutive non-probability sampling technique was used for selecting the patients.

Included patients were 18 to 60 years old of either gender, undergoing exploratory laparotomy, which was defined as a surgical procedure in which an incision was made in the abdominal wall to gain access to the abdominal cavity for the purpose of diagnosing or treating various medical conditions i.e inspection of internal organs, including the stomach, intestines, liver, pancreas, and spleen, to identify issues such as injury, infection, tumors, or other abnormalities. Patients with pneumonia, pregnancy, and thyroid dysfunction were excluded. After obtaining consent from all patients, their basic demographics were recorded, including age, BMI, gender, financial status, residence, and education status. The history of hypertension, diabetes, and smoking was recorded as well. Patients undergoing exploratory laparotomy were examined for postoperative ileus, which was labelled positive on clinical evaluation,

observing all of the following criteria: abnormal distension, absence of bowel movements or flatus, nausea/vomiting, and lack of bowel sounds on auscultation within 5 days after surgery. The comprehensive evaluation was conducted under the supervision of a consultant with five years of post-fellowship experience. A standardized, pre-designed, structured proforma was to document the details of patients.

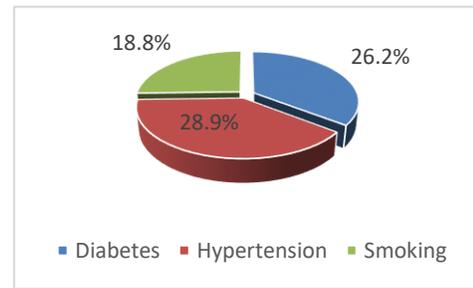
To collect and analyze the data, IBM SPSS 25 software was used. Frequencies and percentages were estimated for gender, post-operative ileus, diabetes, hypertension, smoking, financial status, residence, education status, and occupation status. The mean and SD were calculated for age, BMI, duration of surgery, and hospital stay. Age, gender, diabetes, hypertension, smoking, financial status, residence, education status, occupation status, BMI, duration of surgery, and hospital stay were stratified by postoperative ileus using the chi-square test; P values ≤ 0.05 were considered significant.

**Results**

The present study had 149 patients who underwent exploratory laparotomy. The patients had a mean age of 42.28 ± 13.24 years. Their mean BMI was 26.76 ± 2.01 kg/m<sup>2</sup>. The mean postoperative hospital stay was 2.85 ± 1.40 days, and the mean duration of surgery was 100.08 ± 6.01 minutes.

Regarding demographics, male patients accounted for 83 (55.7%) of the cohort. The majority of patients were illiterate (90, 60.4%) and unemployed (93, 62.4%). Most of the patients lived in rural areas (84, 56.4%) and belonged to a low socioeconomic class (75, 50.3%) (Table 1). Figure 1 presents the comorbidities profile of the patients; diabetes was present in 39 (26.2%) patients, and hypertension in 43 (28.9%).

Postoperative ileus developed in 13 patients (8.7%) (Table 2). Subgroup analysis revealed two factors significantly associated with its occurrence. Patients who developed ileus had a significantly longer hospital stay 9 (69.2%) (p = 0.01). Longer operative time was significantly associated with ileus (p = 0.02) (Table 3).



**Figure 1: Comorbidities**

**Table 1: Demographics**

Demographics	n	%	
Gender	Male	83	55.7%
	Female	66	44.3%
Education status	Literate	59	39.6%
	Illiterate	90	60.4%
Occupation status	Employed	56	37.6%
	Unemployed	93	62.4%
Area of residence	Urban	65	43.6%
	Rural	84	56.4%
Socioeconomic status	Low	75	50.3%
	Middle	54	36.2%
	High	20	13.4%

**Table 2: Frequency of postoperative ileus**

Postoperative ileus	n	%
Yes	13	8.7%
No	136	91.3%

**Table 3: Stratification of postoperative ileus with various parameters**

Parameters	Postoperative ileus				P value	
	Yes		No			
	n	%	n	%		
Age distribution (Years)	18 to 35	4	30.8%	48	35.3%	0.62
	36 to 50	3	23.1%	43	31.6%	
	51 to 60	6	46.2%	45	33.1%	
BMI (Kg/m <sup>2</sup> )	18 to 24.9	2	15.4%	34	25.0%	0.43
	> 24.9	11	84.6%	102	75.0%	
Hospital stays (Days)	1 to 3	4	30.8%	89	65.4%	0.01
	> 3	9	69.2%	47	34.6%	
Duration of surgery (Mins)	90 to 95	0	0.0%	41	30.1%	0.02
	> 95	13	100.0%	95	69.9%	
Gender	Male	9	69.2%	74	54.4%	0.30
	Female	4	30.8%	62	45.6%	
Diabetes	Yes	3	23.1%	36	26.5%	0.79
	No	10	76.9%	100	73.5%	
Hypertension	Yes	3	23.1%	40	29.4%	0.63
	No	10	76.9%	96	70.6%	
Smoking	Yes	3	23.1%	25	18.4%	0.67
	No	10	76.9%	111	81.6%	
Education status	Literate	5	38.5%	54	39.7%	0.93
	Illiterate	8	61.5%	82	60.3%	
Occupation status	Employed	2	15.4%	54	39.7%	0.08
	Unemployed	11	84.6%	82	60.3%	
Area of residence	Urban	5	38.5%	60	44.1%	0.69
	Rural	8	61.5%	76	55.9%	
Socioeconomic status	Low	6	46.2%	69	50.7%	0.67
	Middle	6	46.2%	48	35.3%	
	High	1	7.7%	19	14.0%	

## Discussion

The pathophysiology and clinical management of postoperative ileus (POI) remain a notable challenge in the abdominal surgery paradigm, with substantial implications for patient recovery and healthcare systems. Recent studies underscore its multiple etiologies, including neurogenic, inflammatory, and pharmacological components. The study by Venara et al. highlights that despite greater understanding and the adoption of multimodal enhanced recovery after surgery, POI continues to affect 10–30% of patients after abdominal surgeries. This variability is partially linked to the deficiency of a universally accepted definition, which complicates comparative research and the standardisation of preventative strategies. The pathophysiology is conceptualised into three phases: an initial neurogenic response mediated by sympathetic overactivity, a subsequent inflammatory phase triggered by intestinal manipulation, and a final resolution phase involving vagal activation (14).

In the context of emergency surgery, the risk profile for POI appears different. The study by Amati et al. examined POI after emergency surgery for acute bowel obstruction (ABO), a scenario involving a pathologically altered and often ischaemic bowel (Amati et al., 2025). Their findings identified male gender, chronic steroid therapy, elevated postoperative C-reactive protein (CRP) levels, and a higher Sequential Organ Failure Assessment (SOFA) score as independent predictors for POI (15). This highlights the distinct role of systemic inflammation and preoperative immunosuppression in this patient subset, factors that may be less dominant in elective settings. The reported POI frequency of 33.5% in their cohort highlights that emergency procedures on compromised bowel have a substantially elevated risk. Their observation that POI correlated strongly with postoperative respiratory and surgical complications demonstrates the flow of morbidity it can trigger, extending its impact beyond gastrointestinal recovery alone (15).

Preventive and management strategies continue to evolve, combining both pharmacological and non-pharmacological approaches. The study by Iskander et al. provides evidence on numerous interventions, categorising them into preventive measures, such as coffee consumption, chewing gum, probiotics, and Daikenchuto, and therapeutic agents such as alvimopan, lidocaine, and non-steroidal anti-inflammatory drugs (NSAIDs) (16). The integration of these measures within structured ERAS pathways is associated with reduced frequency and duration of POI. The benefit of laparoscopic surgery is consistently highlighted across studies for its role in minimising bowel handling and the associated inflammatory response. However, as noted by Amati et al., the application of laparoscopy in emergency settings remains limited, often due to adhesions or the severity of the condition, leaving a gap where alternative preventive strategies are crucial (15).

The present study contributes data from a cohort undergoing exploratory laparotomy in a tertiary care setting. The demographic profile of the participants revealed that most patients were in their 4th decade of life and were mostly male, reflecting a surgically active population. The high rates of illiteracy, unemployment, and rural residence highlight the socioeconomic context, which may affect access to care and health literacy, but did not show a statistical association with POI.

The POI frequency in this study was 8.7%. This figure aligns with the lower end of the 10–30% reported by Venara et al. and is lower than the 33.5% reported for emergency ABO surgery by Amati et al. (14,15). This discrepancy can be attributed to differences in patient selection, surgical indications, or the definition of POI applied. A prolonged hospital stay of more than 3 days was associated with POI; this aligns with Venara et al., who reported that POI increases length of stay. (14) Operative duration emerged as a significant risk factor in the present study as well. Patients who had developed POI had a surgical time of > 95 minutes. This supports the pathophysiological principle that the duration of bowel exposure and manipulation directly relates to the degree of surgically induced inflammation and neural inhibition.

## Conclusion

In conclusion, this study demonstrated that POI is a relevant complication of exploratory laparotomy, developed in 8.7% patients, and it was significantly associated with prolonged operative time and hospital stay.

## Declarations

### Data Availability statement

All data generated or analysed during the study are included in the manuscript.

### Ethics approval and consent to participate

Approved by the department concerned. (713/BKMC)

### Consent for publication

Approved

### Funding

Not applicable

## Conflict of interest

The authors declared no conflicts of interest.

## Author Contribution

### MB (PGR)

*Manuscript drafting, Data entry, Study Design,*

### AK (Professor)

*Review of Literature, Data analysis, and Study Concept.*

### WUR (PGR)

*Critical Input and literature search*

### FA (PGR)

*Critical Input and literature search.*

### SMN (PGR)

*Critical Input and literature search*

*All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.*

## References

1. Wang J, Cheng L, Liu J, Zhang B, Wang W, Zhu W. Laparoscopy vs laparotomy for the management of abdominal trauma: a systematic review and meta-analysis. *Front Surg.* 2022;9:817134. <https://doi.org/10.3389/fsurg.2022.817134>
2. Aggarwal G, Scott M, Peden CJ. Emergency laparotomy. *Anesthesiol Clin.* 2022;40(1):199-211. <https://doi.org/10.1016/j.anclin.2021.11.010>
3. Barrow E, Anderson ID, Varley S, Pichel AC, Peden CJ, Saunders DI, et al. Current UK practice in emergency laparotomy. *Ann R Coll Surg Engl.* 2013;95(8):599-603. <https://doi.org/10.1308/rcsann.2013.95.8.599>
4. Bozzay JD, Walker PF, Schechtman DW, Shaikh F, Stewart L, Carson ML, et al. Risk factors for abdominal surgical site infection after exploratory laparotomy among combat casualties. *J Trauma Acute Care Surg.* 2021;91(2 Suppl 2):S247-S255. <https://doi.org/10.1097/TA.0000000000003109>
5. Hendriksen BS, Keeney L, Morrell D, Candela X, Oh J, Hollenbeak CS, et al. Epidemiology and perioperative mortality of exploratory laparotomy in rural Ghana. *Ann Glob Health.* 2020;86(1):19. <https://doi.org/10.5334/aogh.2586>
6. Foster K, Yon J, Pelzl CE, Salottolo K, Mentzer C, Quan G, et al. Six-year national study of damage control laparotomy and the effect of repeat re-exploration on the rate of infectious complications. *Trauma*

- Surg Acute Care Open. 2021;6(1):e000706. <https://doi.org/10.1136/tsaco-2021-000706>
7. Bozzay JD, Walker PF, Schechtman DW, Shaikh F, Stewart L, Tribble DR, et al. Outcomes of exploratory laparotomy and abdominal infections among combat casualties. *J Surg Res.* 2021;257:285-293. <https://doi.org/10.1016/j.jss.2020.07.075>
8. Wells CI, Milne TGE, Seo SHB, Chapman SJ, Vather R, Bissett IP, et al. Post-operative ileus: definitions, mechanisms and controversies. *ANZ J Surg.* 2022;92(1-2):62-68. <https://doi.org/10.1111/ans.17297>
9. Garfinkle R, Savage P, Boutros M, Landry T, Reynier P, Morin N, et al. Incidence and predictors of postoperative ileus after loop ileostomy closure: a systematic review and meta-analysis. *Surg Endosc.* 2019;33(8):2430-2443. <https://doi.org/10.1007/s00464-019-06794-y>
10. Khawaja ZH, Gendia A, Adnan N, Ahmed J. Prevention and management of postoperative ileus: a review of current practice. *Cureus.* 2022;14(2):e22652. <https://doi.org/10.7759/cureus.22652>
11. Ghansham, Najeeb Ullah, Patoli S, Kumar V, Burki B, Ali M, et al. Frequency of postoperative ileus after exploratory laparotomy in patients admitted to a tertiary care hospital. *Pak J Med Health Sci.* 2022;16(12):891-894. <https://doi.org/10.53350/pjmhs20221612891>
12. Wells CI, Milne TGE, Seo SHB, Chapman SJ, Vather R, Bissett IP, et al. Post-operative ileus: definitions, mechanisms and controversies. *ANZ J Surg.* 2022;92(1-2):62-68. <https://doi.org/10.1111/ans.17297>
13. Traeger L, Koullouros M, Bedrikovetski S, Kroon HM, Moore JW, Sammour T. Global cost of postoperative ileus following abdominal surgery: meta-analysis. *BJS Open.* 2023;7(3):zrad054. <https://doi.org/10.1093/bjsopen/zrad054>
14. Venara A, Neunlist M, Slim K, Barbieux J, Colas PA, Hamy A, et al. Postoperative ileus: pathophysiology, incidence, and prevention. *J Visc Surg.* 2016;153(6):439-446. <https://doi.org/10.1016/j.jviscsurg.2016.08.010>
15. Amati AL, Kümmel N, Negruta N, Reichert M, Schwandner T, Noll J, et al. Postoperative ileus after emergency surgery for acute bowel obstruction: a case-control study of predictors and impact on recovery. *Langenbecks Arch Surg.* 2025;410:260. <https://doi.org/10.1007/s00423-025-03851-0>
16. Iskander O. An outline of the management and prevention of postoperative ileus: a review. *Medicine (Baltimore).* 2024;103(24):e38177. <https://doi.org/10.1097/MD.0000000000038177>



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