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Study Assessment Of Laparotomy Patients With P-POSSUM Scoring System.

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ABSTRACT

Our retrospective study investigates the characteristics and outcomes of 100 laparotomy patients, presenting a comprehensive analysis of procedural details, preoperative cardiovascular status, operative parameters, and postoperative complications. The most common procedure was resection with ileostomy/colostomy (30%), reflecting the prevalence of conditions requiring bowel diversion. Operative severity scores predominantly fell within the major category, emphasizing the complexity of laparotomy cases. While the majority of patients had no preexisting cardiovascular abnormalities (86%), the presence of antihypertensive medication usage (12%) and one patient on warfarin therapy (1%) underscores the need for meticulous perioperative management. Intraoperatively, the study revealed diverse challenges, with blood loss ranging from minimal (<100ml, 26%) to significant (>1000ml, 4%) and peritoneal soiling varying from none (25%) to extensive contamination (46%). Although the complication rate was 62%, 38% of patients recovered without significant postoperative complaints. Respiratory tract infection emerged as the most common complication (10%). This study contributes valuable insights into the multifaceted landscape of laparotomy, highlighting the need for tailored approaches and vigilant perioperative care. Future research should explore multi-center collaborations and prospective data collection for a more nuanced understanding of laparotomy outcomes.

Keywords: Laparotomy, Operative Severity, Cardiovascular Status, Complications.

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INTRODUCTION

Laparotomy, a common surgical procedure, poses inherent risks to patients, necessitating precise risk stratification tools for postoperative outcome prediction [1, 2]. The Physiological and Operative Severity Score for the Enumeration of Mortality and Morbidity (P-POSSUM) has emerged as a valuable prognostic tool, integrating physiological and operative parameters to assess surgical risk [3-5]. This study aims to comprehensively evaluate laparotomy patients using the P-POSSUM scoring system to enhance preoperative risk stratification and guide clinical decision-making. By examining a diverse cohort of laparotomy cases, we seek to validate the effectiveness of the P-POSSUM model in predicting postoperative morbidity and mortality. This research contributes to the refinement of surgical risk assessment methodologies, ultimately optimizing patient care and fostering a more informed approach to laparotomy procedures [6, 7].

MATERIAL AND METHODS

Our retrospective study was conducted under the Department of General Surgery from January 2021 to December 2021, we aimed to assess the predictive efficacy of the Physiological and Operative Severity Score for the enumeration of Mortality and morbidity (P-POSSUM) in emergency laparotomies. A total of 100 cases, spanning the 12-month period, were included in the analysis. Comprehensive patient information, relevant medical history, and appropriate investigations were collected during hospitalization, following standard procedures.

Upon data collection, patients were scored based on their physiological parameters, including age, cardiac and respiratory history, blood pressure, pulse rate, Glasgow Coma Scale (GCS), haemoglobin levels, white blood cell (WBC) count, urea, sodium, potassium, and electrocardiogram (ECG) findings. Additionally, operative severity scores were assigned, considering all laparotomies as major. The physiological score ranged from 12 to 88, while the operative score ranged from 6 to 48, resulting in a minimum total score of 18 and a maximum of 136.

The mortality rates were observed and tabulated, and expected mortality rates were calculated using the P-POSSUM equation. Subsequently, linear regression analysis was applied to calculate the observed-to-expected (O: E) ratio. Chi-square tests were then performed to ascertain the significance of any differences between the predicted and observed mortality rates. A significance level of 0.05 was chosen for hypothesis testing.

Finally, vital parameters, demographic profiles, and details of emergency cases and surgeries were documented for statistical analysis. The obtained chi-square values and associated p-values were utilized to evaluate the significance and effectiveness of the P-POSSUM scoring system in predicting mortality and morbidity outcomes in emergency laparotomies.

RESULTS

In our study out of 100 patients taken for laparotomy, Resection with iliostomy / colostomy was the most commonly done procedure with a total of 30 cases (30%). This was followed by Resection and anastomosis in 22 cases (22%), Primary Closure of perforation with omental patch 19 cases (19%), Adhesiolysis of band 8 cases (8%) and Appendicectomy 6(6%).

In our study out 100 patients 86 patients having no CVS abnormality (86%),12 patients were on antihypertensive (12%),1 patient on warfarin therapy(1%) and 1 patients found to have cardiomegaly(1%).

Table 1: Operative severity Distribution

Operative severity score	Description	Frequency	Percentage
4	Major	99	99%
8	Major +	1	1%
Total		100	100%

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Table 2: Total Blood Loss Distribution

Total Blood Loss score	Description	Frequency	Percentage
1	<100	26	26%
2	101-500	64	64%
4	501-999	6	6%
8	>1000	4	4%
Total		100	100%

In our study out 100 patients 64 patients have blood loss between 101-500ml (64%), 26 patients have blood loss <100ml(26%), 6 patients have blood loss between 501-999ml (6%), 4 patients have blood loss >1000ml(4%).

Table 3: Peritoneal Soiling Distribution

Peritoneal Soiling score	Description	Frequency	Percentage
1	None	25	25%
2	Minor (serous fluid)	17	17%
4	Local pus	12	12%
8	Free bowel content, pus, blood	46	46%
Total		100	100%

Table 4: Presence of Malignancy Distribution

Presence of malignancy score	Description	Frequency	Percentage
1	None	95	95%
2	Primary only	3	3%
4	Nodal metastasis	2	2%
Total		100	100%

Table 5: Mode of Surgery Distribution

Mode of Surgery Score	Description	Frequency	Percentage
4	Emergency	94	94%
8	Emergency<2 hours	6	6%
Total		100	100%

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Table 6: Complication Distribution

Complications	Frequency	Percentage
Expired	27	27%
Abdominal Burst	2	2%
Anastomotic leak	1	1%
DVT	1	1%
Hypotension	6	6%
Ileus	6	6%
Respiratory Tract Infection	10	10%
Urinary Tract Infection	3	3%
Wound site infection	6	6%
None	38	38%
Total	100	100%

DISCUSSION

The present study provides a comprehensive analysis of laparotomy patients, focusing on procedural characteristics, preoperative comorbidities, and postoperative outcomes. The observed distribution of operative severity, blood loss, peritoneal soiling, presence of malignancy, mode of surgery, and complications sheds light on the multifaceted nature of laparotomy cases.

The most frequently performed procedure in our study was resection with ileostomy/colostomy (30%), highlighting the prevalence of conditions requiring bowel resection and diversion. This was followed by resection and anastomosis (22%), primary closure of perforation with omental patch (19%), adhesiolysis of bands (8%), and appendicectomy (6%). The distribution of operative severity scores primarily clustered around the major category, with a minor representation in the major + category (1%). This reflects the diverse range of laparotomy cases, with the majority falling within the major operative severity spectrum.

Preoperative cardiovascular status is a crucial determinant of surgical risk. In our cohort, the majority of patients had no cardiovascular abnormalities (86%), underlining the importance of robust patient selection for laparotomy. However, the presence of patients on antihypertensive medications (12%) and one patient on warfarin therapy (1%) indicates the need for vigilant perioperative management in individuals with cardiovascular comorbidities.

The distribution of total blood loss and peritoneal soiling scores provides insight into the intraoperative challenges encountered. The most common range of blood loss was 101-500ml (64%), with a substantial proportion experiencing minimal blood loss (<100ml, 26%). Peritoneal soiling was predominantly characterized by the absence of soiling (25%) or minor soiling with serous fluid (17%). However, a significant portion of cases exhibited higher peritoneal soiling scores, indicating the presence of local pus (12%) or free bowel content, pus, and blood (46%).

The majority of patients did not present with malignancy (95%), reinforcing the notion that laparotomies are performed for various indications beyond oncological resections. The mode of surgery was predominantly categorized as emergency (94%), with a smaller subset falling into the emergency category requiring intervention within 2 hours (6%). These findings underscore the acuity and urgency associated with the majority of laparotomy cases.

Analysis of postoperative complications is crucial for understanding the morbidity associated with laparotomy. The overall complication rate in our study was 62%, with the most common complication being respiratory tract infection (10%). Other complications included expired cases (27%),

abdominal burst (2%), anastomotic leak (1%), deep vein thrombosis (DVT, 1%), hypotension (6%), ileus (6%), urinary tract infection (3%), and wound site infection (6%). Notably, 38% of patients recovered without significant postoperative complaints.

The high frequency of resection with ileostomy/colostomy in our study aligns with the literature, reflecting the prevalence of conditions such as bowel obstruction, perforation, and malignancy necessitating bowel resection and diversion. The distribution of operative severity scores predominantly in the major category suggests that laparotomies are often performed for substantial intra-abdominal pathology.

The cardiovascular profile of the study population indicates that a significant proportion of laparotomy patients have no preexisting cardiovascular abnormalities. However, the presence of patients on antihypertensive medications and anticoagulant therapy underscores the importance of meticulous perioperative management and risk stratification. The distribution of blood loss and peritoneal soiling scores highlights the heterogeneity of intraoperative challenges faced during laparotomy. While a substantial number of cases experienced minimal blood loss and low peritoneal soiling, a noteworthy percentage encountered higher blood loss and significant peritoneal contamination, reflecting the complexity of cases and the need for tailored surgical approaches [7-9].

The low incidence of malignancy in our cohort suggests that laparotomies are not exclusively performed for oncological resections but rather for a broad spectrum of surgical indications. The predominance of emergency surgeries underscores the acute nature of many laparotomy cases, requiring prompt intervention to address emergent intra-abdominal conditions. The observed postoperative complication rate of 62% is consistent with existing literature, emphasizing the inherent challenges associated with laparotomy. Respiratory tract infection emerged as the most common complication, highlighting the importance of vigilant postoperative respiratory care. The relatively high percentage of patients recovering without significant complaints suggests successful outcomes in a substantial proportion of cases.

CONCLUSION

In conclusion, this study contributes to the understanding of laparotomy patients by elucidating procedural characteristics, preoperative cardiovascular status, operative parameters, and postoperative complications. The high prevalence of resection with ileostomy/colostomy and the predominantly major operative severity scores highlight the complexity of laparotomy cases. The diverse distribution of blood loss and peritoneal soiling underscores the varied intraoperative challenges encountered. Despite the high complication rate, a substantial proportion of patients recovered without significant postoperative complaints. These findings emphasize the need for individualized patient management and underscore the importance of continued research to optimize outcomes in the challenging landscape of laparotomies.

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