

Hospital Readmission after Emergency Laparotomy: A study of Causes and Factors involved.

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Abstract:

Background: Hospital re-admissions are a consequence of natural course of patient's disease or results from suboptimal care during first admission. Apart from causing increased expenditure, readmission immensely adds to the distress of the patient as well as his relatives. The aim of the study was to identify risk factors for 30- day unplanned readmission following emergency laparotomy for acute abdomen cases in order to suggest optimization of intra- operative and post-operative care

Materials and Methods: In this prospective observational study, 30 patients who underwent laparotomy in Government General Hospital, Guntur and were readmitted within 30 days of hospitalization were followed up. They were evaluated with a detailed history, previous admission records and operation notes, and biochemical investigations.

Results: Surgical Site Infections and Burst abdomen were the leading causes of readmission. Anemia and hypoproteinemia were significant contributory factors along with pre-existing comorbidities like Diabetes Mellitus and Hypertension. Post-operative respiratory complications and UTI were also significant risk factors for readmission

Conclusion: Hospital readmission is a significant source of physical, psychological and financial burden for the patient. Better post-operative care and pre-operative optimization of the patient (when possible) can reduce the hospital readmission rates after emergency laparotomies

Key Word: Hospital re-admission, Emergency Laparotomy, Post-operative complications

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I. Introduction

Hospital readmission rates following surgery are increasingly used as a marker of quality of care and are used in pay-for-performance metrics. As such, reducing hospital readmission rates has become a focus of both surgeons and hospital administrators as well as policy makers.^{1,2,3,4} Readmission following inpatient hospitalization is common and costly. In addition, several studies have indicated that readmission is associated with increased mortality and morbidity, and a decreased quality of life.^{5,6,7} Emergency general surgery (EGS) patients represent a unique population at high risk for medical errors and complications following surgery.^{8,9} Approximately half of all patients undergoing EGS will have a postoperative complication,^{10,11} and postoperative complications have been closely linked to hospital readmission.^{12,13} In addition to the financial implications, a patient's unplanned return to the hospital not only limits hospital resources but also deprives another patient who needs care. It also negatively impacts the patient's quality of life. Thus, reducing the number of 30-day readmissions following surgery is important not only for institutions, but also for patients. Decreasing the rates of surgical readmission represents an opportunity to improve patient care.¹⁴

II. Material And Methods

This prospective observational study was carried out on patients admitted in Department of General Surgery at government General Hospital, Guntur, Andhra Pradesh from January 2019 to January 2020. A total of 30 patients (both male and females) of age ≥ 18 years were followed in this study.

Study Design: Prospective observational study

Study Location: This was a tertiary care teaching hospital based study done in Department of General Surgery, at Government General Hospital, Guntur, Andhra Pradesh.

Study Duration: January 2019 to January 2020

Sample size: 30 patients.

Aims and objectives: To study the causes for hospital readmission following emergency laparotomy for acute abdomen within a time period of 30 days.

To attempt to develop standard treatment protocols for patients presenting with acute abdomen to decrease the rate of readmission and ensure quality of care.

Inclusion criteria:

Patients aged above 18 years, of either sex undergoing emergency laparotomy for acute abdomen and seeking readmission within 30 days in Department of General Surgery , Government General Hospital, Guntur.

Exclusion criteria:

1. Pregnant women;
2. Patients with previous surgery elsewhere, presenting with complications.
3. Patients presenting with blunt trauma to abdomen.
4. Patient readmitted for staged surgical procedure.
5. Patient who refused to give informed consent.

Procedure methodology

All cases readmitted following emergency laparotomy for acute abdomen within 30days of primary surgery in various units of surgical department at our hospital were included in the study. Information regarding indication of surgery, procedure performed, date of admission, duration of stay in hospital, and immediate post operative complications was maintained.

Patients who were readmitted within 30 days were evaluated clinically, their demographic data collected and following laboratory investigations were sent for :

- Complete haemogram,
- Liver function test,
- Renal function test.
- Viral marker for Hepatitis B , Hepatitis C, HIV,
- PT, aPTT , INR,
- Chest X-ray, X-ray erect abdomen , CECT Abdomen.

Patients readmitted were either managed conservatively or underwent a re-exploration procedure

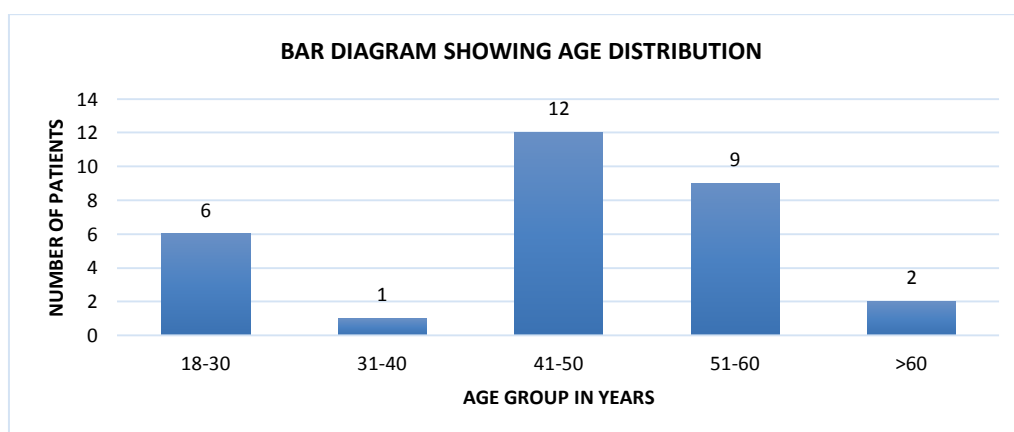
III. Result

Data regarding various possible factors that contributed to re- admission were collected and summarized:

Table no 1 Shows age distribution of patients readmitted. It was found that out of 30 patients readmitted, majority of the patients were in the age group of 41 years to 60 years (74.6%) with a median age of 46years.

Table no 1: Shows age distribution of patients readmitted

Age group of patients	Number of patients
18-30 yrs	6
31-40 yrs	1
41-50 yrs	12
51-60 yrs	9
>60 yrs	2



Gender distribution :

Table no 2 shows gender distribution of patients readmitted after emergency laparotomy within 30 days. Out of 30 readmitted patients 73.3% were males and 26.7% were females

Table no2: gender distribution of patients

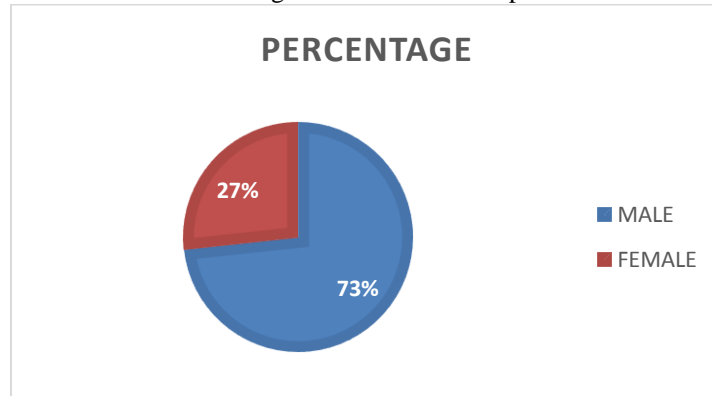


Table no3: Patients were evaluated for presence of various co- morbidities such as Diabetes Mellitus, Hypertension, Hypothyroidism, Tuberculosis, Coronary Artery Disease etc. Out of 30 patients, 18 patients had a co-morbidity thus showing that pre-existing co-morbidities played a role in contributing to readmissions and post-operative complications to varying extents. Thus attention to these conditions and their optimum management contributes to reduced rates of readmission. Diabetes Mellitus and Hypertension were the most common co-morbidities observed in patients readmitted. Diabetes Mellitus usually resulted in post-operative wound complications and its resultant consequences including Burst Abdomen.

Table no3

Co-morbidity	Number of patients
Diabetes Mellitus	5
Hypertension	7
Coronary Artery Disease	2
Tuberculosis	2
Hypothyroidism	1

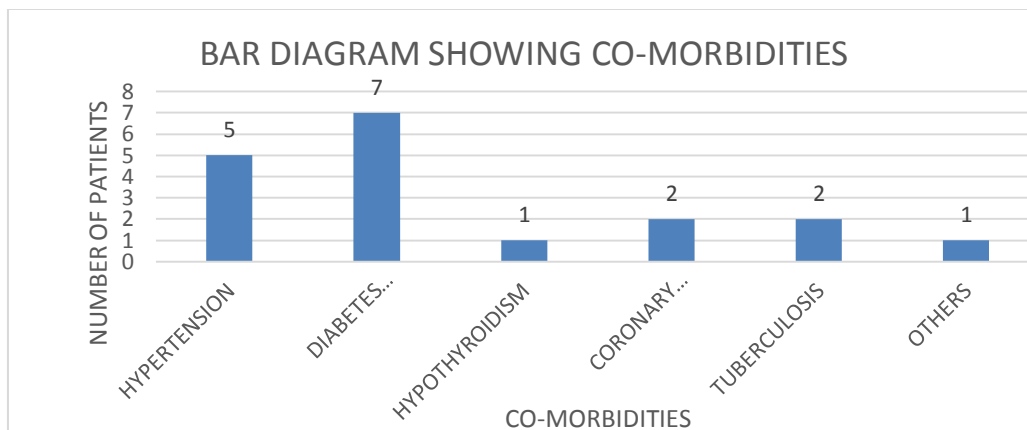


Table no4 shows Hemoglobin levels of patients readmitted . Majority of patients (60%) had hemoglobin levels below 9 gm/ dl. Thus Hemoglobin level of patients was an important indicator of likelihood of readmission of patient due to various complications. Hemoglobin was an indicator of nutritional status of a patient.

Hemoglobin in gm/dl	Number of patients
>12 gm/dl	9
9-12 gm/dl	3
<9 gm/dl	18

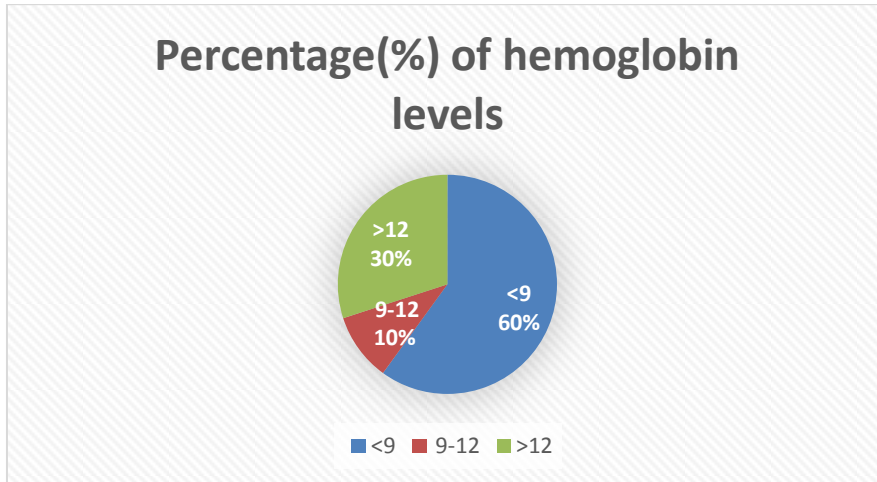


Table no 5 Total Leukocyte Count of patients was obtained and found to be elevated (>11,000) in 57% patients indicating a focus of sepsis in the patients. An infective focus can thus contribute to postoperative morbidities resulting in readmission.

TLC of patients	Number of patients
< 11,000/uL	11
>11,000/uL	19

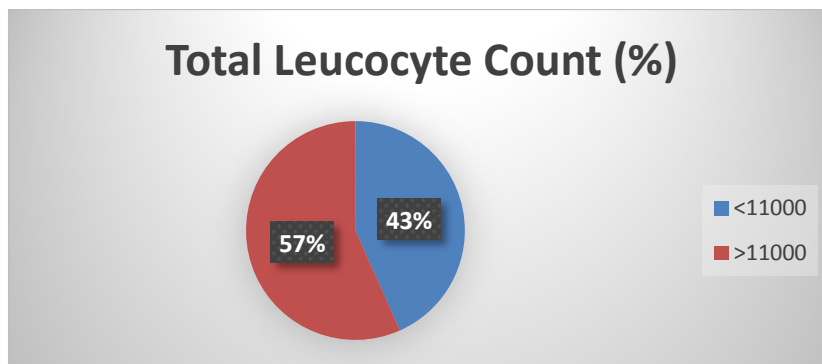


Table no 6 Albumin level of patients was studied. Majority of patients had a low albumin levels thus indicating nutrition status of patient as an important indicator for risk of early readmission

Table no 6

Albumin level	Number of patients
<3.5 gm/dl	19
>3.5 gm/dl	11

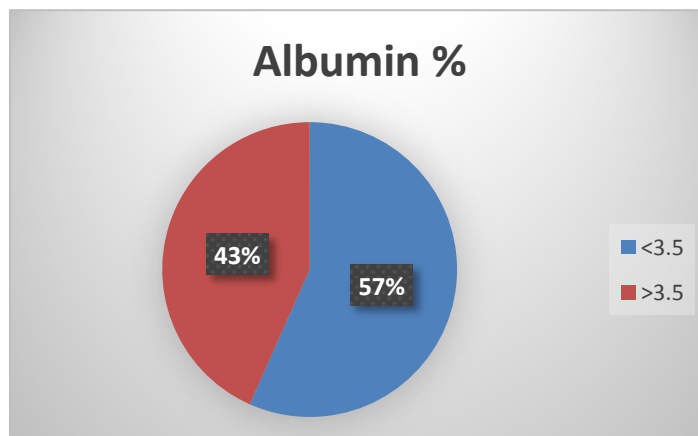


Table 7 : Emergency laparotomy done at initial presentation of acute abdomen was usually for bowel related pathology or liver and gall bladder related pathology. 56.31% of readmitted had initially presented with Obstruction (with equal percentage of small (26.66%) and large bowel (26.65%) pathology) followed by 40% of readmitted cases who had presented due to peritonitis (prepyloric 30% and Ileal perforation 10%). The various procedures performed initially are as shown below :

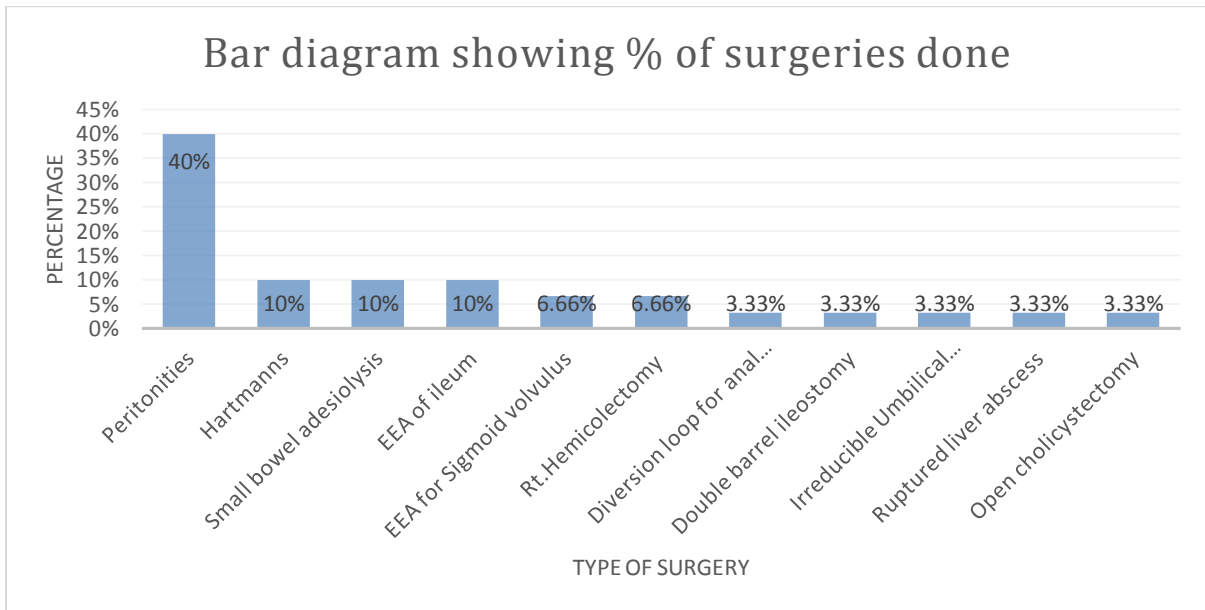


Table 8 : Post operative complications after initial surgery of the patients were enquired. Majority of patients had experienced Respiratory or related complications. UTI was also a frequent complication .Other complications that occurred were as shown below :

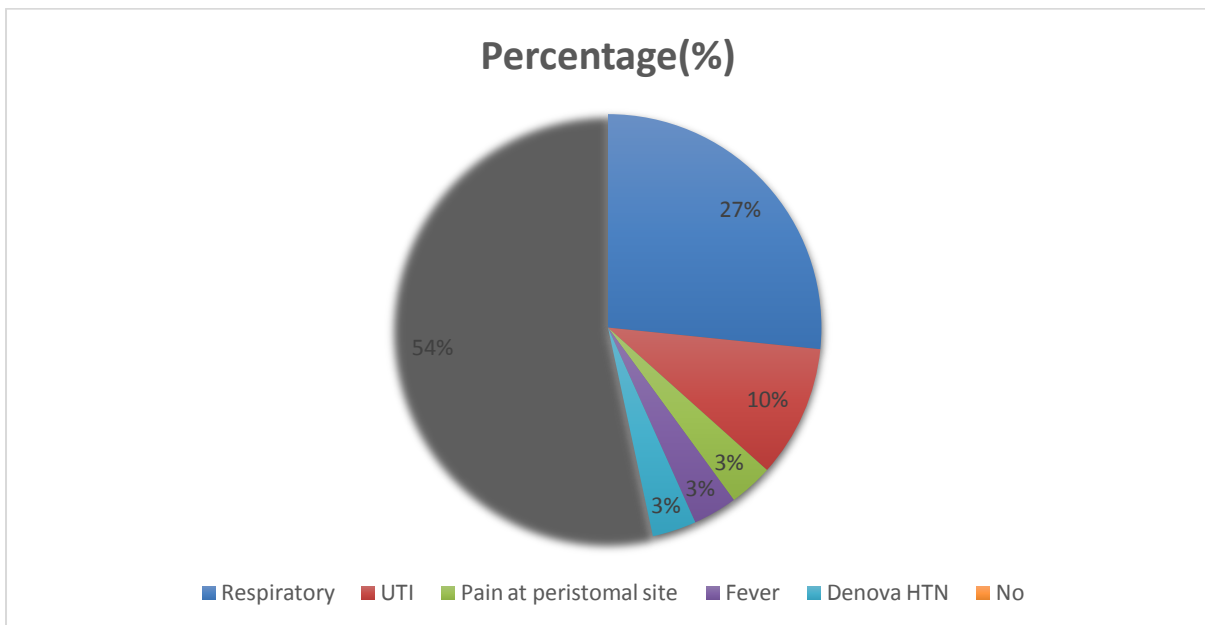


Table 9 : Length of hospital stay at primary admission was enquired. The median length of stay was 9 dyas. Majority of patients readmitted had a hospital stay duration of less than 8 days. The data is as shown below :

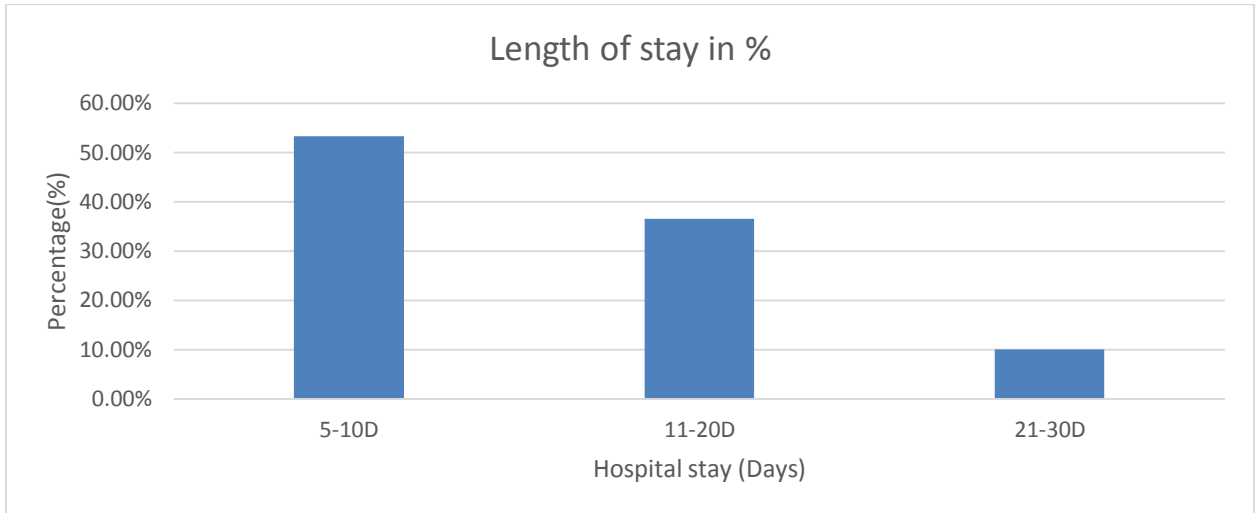


Table 10 : Day of Readmission. It was found that majority of the patients (53.3%) were readmitted within 9 days from discharge, followed by 40% after 15 days of discharge.

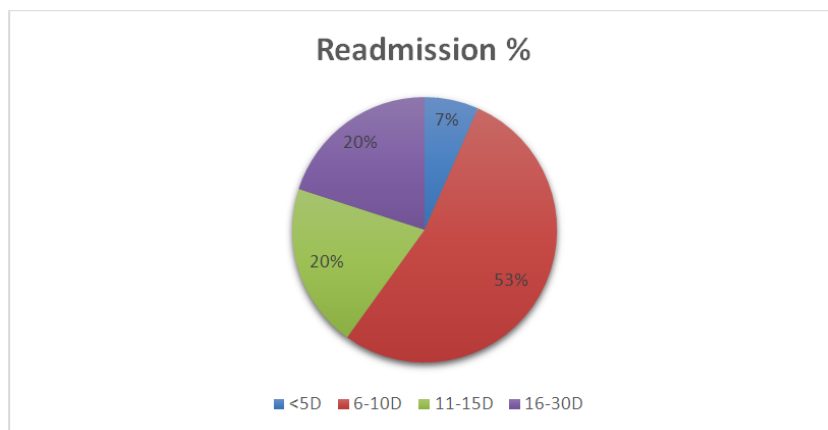


Table 11 : Cause of Readmission. The causes of readmission of the patients were studied. Below data shows the cause for readmission in majority was wound related (SSI 20%); Subacute Intestinal Obstruction and Gastrointestinal contributed to 16% each, Burst abdomen and Stoma related 13.3% each, followed by EC fistula and UTI 6.6% each, and Respiratory complications 3.3%.

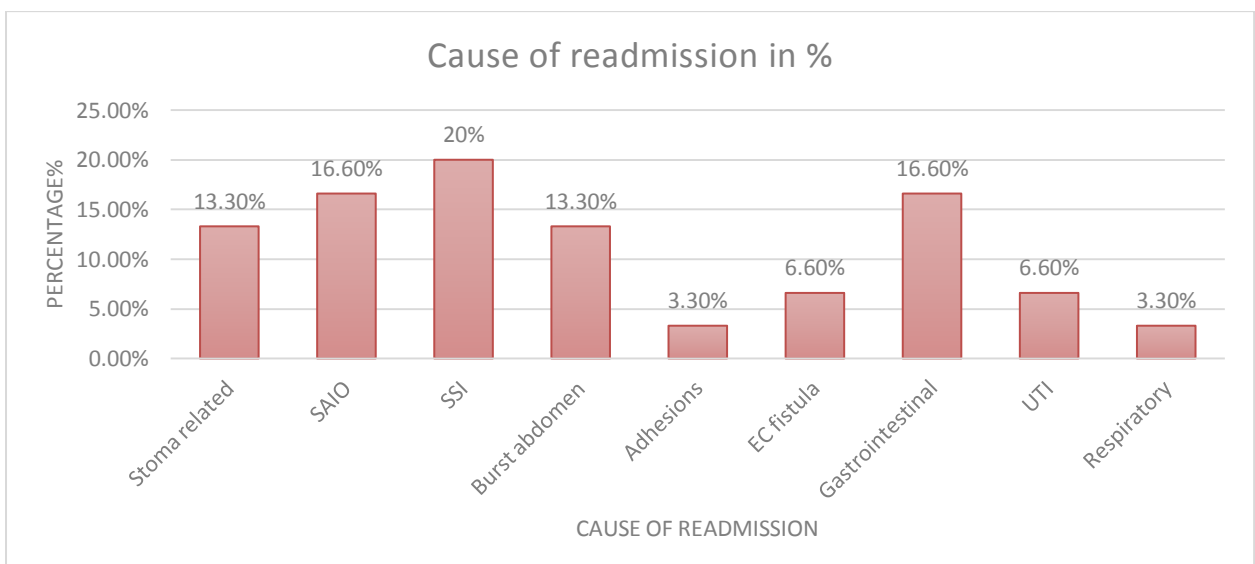


Table 12 : Management of readmitted cases. Readmitted cases were either managed conservatively or re-explored. Only 9 cases were re-explored while remaining 21 cases were managed conservatively.

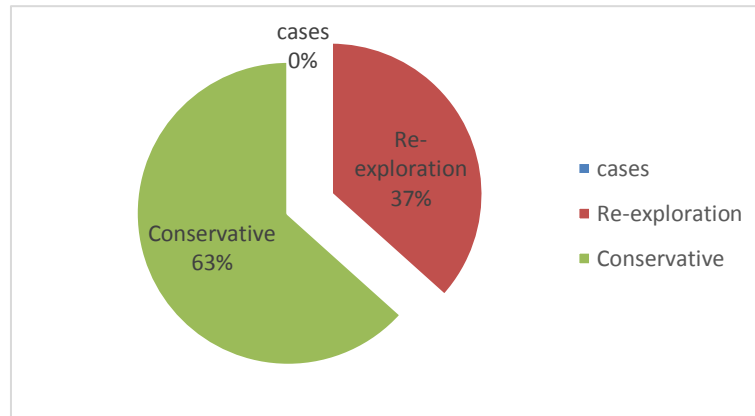
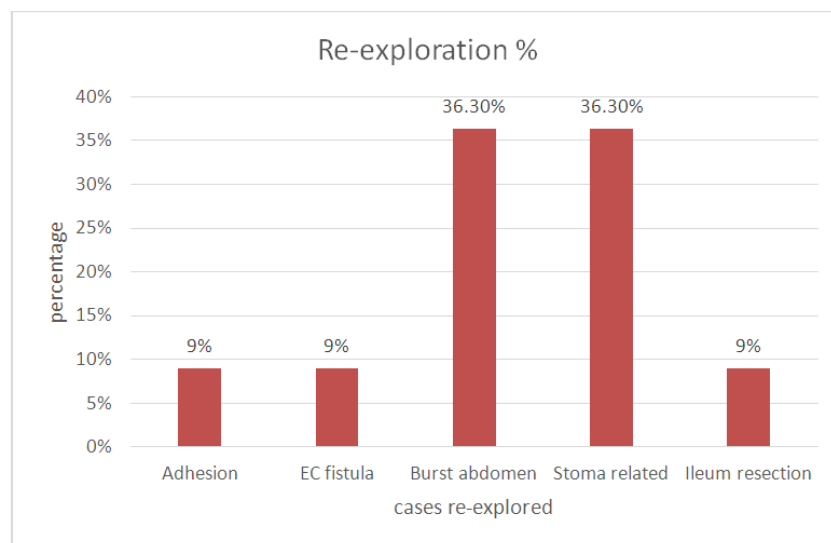


Table 13 : Re-explored cases. Majority of re-explored cases were Burst abdomen and Stoma related cases each constituting 36.3%, followed by bowel obstruction (18%) and EC fistulas 9%.



The above results can be summarised as follows

- Patients who have been readmitted were in the age group of 41 to 60 years and predominantly were males.
- Majority of the patients who were readmitted had undergone exploratory laparotomy for acute small bowel obstruction where ileostomy was fashioned during the index admission.
- A significant number of readmitted patients had undergone exploratory laparotomy and closure of prepyloric perforation who presented with clinical features of sub-acute intestinal obstruction.
- Surgical site infections and burst abdomen were the leading cause of readmission.
- Patients with co-morbidities like diabetes mellitus, anemia, hypoproteinemia had a higher incidence of surgical site infections and burst abdomen that required readmission and surgical reintervention.

IV. Discussion

Hospital readmissions after abdominal surgery are disruptive for the patients as well as their families and correlate with poor outcomes, including reoperation or death. Readmissions after hospitalization have been a matter of concern for acute medical ailments for many years, but it has not been well studied in the surgical specialties. This is remarkable given the frequency of surgeries being performed, the overall cost of surgical care, and the perceived association between surgical readmission and quality of care.¹⁵

Patient demographics in terms of age, gender and BMI have not been found to affect readmission rates in most of the previous studies.¹⁶

Among various biochemical parameters, hypoproteinemia and anemia were found to be a significant risk factor for readmission in the present study. Though hypoproteinemia has not been considered in majority of the studies, some authors have found it to be significant.¹⁶ This is probably due to the fact that hypoproteinemia predisposes patients to increased risk of infections because of poor immunity. Moreover, hypoproteinemia leads to poor wound healing thus causing increased risk of anastomotic leak as well as wound dehiscence.

Stoma creation has consistently been found to be a risk factor for readmission. The possible reason for this in our set up was lack of proper stoma care because of lack of awareness, poor socioeconomic status and non-availability of stoma care specialists. Hanzlik et al have suggested that protocolized peri-operative teaching, such as the "Ileostomy pathway" which has been shown to reduce readmission rates in patients with new ostomies should be adopted in these cases.¹⁷

Of the post-operative complications, respiratory complications and urinary tract infections (7.6% each), were found to be significant risk factors for readmission. Kelly et al also found that UTI was a significant factor for readmission.¹⁸ Although it is difficult to directly correlate UTI with readmission, but UTI possibly remains a hidden focus of infection in the body leading to delayed activation of sepsis and its related complications requiring readmission.

The impact of pre-operative co-morbidities on readmission rates has been significant as depicted in the Table 3. There is abundant evidence in the literature to support that co-morbidities such as diabetes, smoking, and immune-suppression increase the risk of surgical site infections and postoperative pulmonary complications^{19,20} In the present study, Diabetes mellitus and Hypertension were found to be significant factors for readmission.

Although many causes of readmission were not clearly preventable, many of these patients could still benefit from close follow-up or additional supportive services on discharge to ensure that any developing problems are addressed before they progress to more serious conditions. Hence avoiding early discharge in cases with wound sepsis, regular follow up in outdoor and patient education regarding proper wound care, hydration and proper nutritional intake might help in decreasing readmission rates.

V. Conclusion

Reducing readmissions is a noble cost-saving goal with benefits not only to the hospitals, but also to the patients. However, it is critical to understand the underlying factors associated with readmission to appropriately identify quality-improvement measures that address the true problem. Focused and concerted efforts should be made to incorporate readmission-reducing strategies into the care of Emergency Surgical patients, particularly among those at higher risk for readmission.

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