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To Evaluate the Cause of Readmission after Ileostomy Creation and Predict the Risk Factors Leading to Readmission After Ileostomy Creation

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Abstract
The aim of this study is to identify the cause of readmission and to predict the risk factors leading to readmission after ileostomy creation. A retrospective and prospective study of patients who underwent ileostomy creation was done from March 2021 to August 2022 at department of general surgery N.S.C.B. Medical College and Hospital, Jabalpur. Total 193 ileostomies created over a period of 36 months from September 2019 to August 2022. Follow up of this patients and document revies was done. Out of 193, 31 patients were readmitted within 90 days of ileostomy creation. The majority of patients fall in the age group of 40-50 years with mean age of 46 years with mean age of 46 years. Around 64.50% were males and 35.50% were females. Causes for readmission of these patients in which dehydration (45.2%) was the chief cause, followed by stoma obstruction (22.6%) and surgical site infection (16.1%). Out of total 31 readmitted patients, 93.5% (n=29) patients were discharged and 6.5% (n=2) patients were died during hospital stay. Mean hospital stay was 13 days.

INTRODUCTION

Patients with ileostomy requiring readmission creating a high burden on medical healthcare system. Readmission rate among post ileostomy patients at 60 days post discharge have been reported at 28%-29.3%[1,2]. With a diverting loop ileostomy, readmission rates following colon or rectal resection were significant.

The aims of the present study are: To evaluate the cause of readmission after ileostomy creation and To predict the risk factors leading to readmission after ileostomy creation.

MATERIALS AND METHODS

This retrospective and prospective observational single center analysis will be done in the Department of Surgery, Netaji Subhash Chandra Bose Medical College, Jabalpur (M.P.). The total duration of study will be 18 months where in patients who underwent ileostomy creation will be included in this study. The total of 60 patients will be included. Out of these, 30 patients will be accrued in a retrospective manner (September 2019-February 2021) after thorough review of their admission and procedural records. The other half of 30 patients will be accrued during the period of 18 months from March 2021 to August 2022 after meeting the mentioned Inclusion criteria. Statistical analysis of the data was done using SPSS software (IBM, SPSS Inc.) version 13.0. and results tabulated.

RESULTS AND DISCUSSIONS

Over a 36 month period, 193 new ileostomies created at our institute, 16.1% (n=31) patients were readmitted within 90 days of ileostomy creation. Out of which, 64.5% (n=20) patients were male. Maximum patients 32.3% (n=10) were in the age group of 40-50 years with mean age of 46 years (Age range 19-70 years). Around 48.4% patients had history of Alcohol consumption, 54.8% patients had history of tobacco chewing whereas 32.2% patients had history of smoking. Consumption of these substances was seen more common in males. Hypertension was present in 54.8% patients, Diabetes mellitus was present in 12.9% patients whereas Respiratory ailments (Tuberculosis, Asthma and COPD) occurrence was in 48.4% patients. Ileostomy in the study subjects was chiefly created owing to presence of Ileal perforation (41.9%), followed by presence of any obstructive pathology (35.5%) (19.3% small bowel obstruction, 6.5% Obstructed inguinal hernia, 9.7% large bowel obstruction). Significant subset of patients also had Colorectal Cancer (12.9%) for which Ileostomy created as a decompression measure. Causes for readmission of these patients in which dehydration (45.2%) was the chief cause, followed by stoma obstruction (22.6%) and surgical site infection (16.1%). Out of total 31 readmitted patients, 93.5% (n=29) patients were discharged and 6.5% (n=2) patients were died during hospital stay. Mean hospital stay was 13 days. [table 1]

Though Ileostomy creation is a frequent procedure undertaken in surgical management of patients having a myriad of causes, studies focusing on fate and brunt of patients post ileostomy creation are scarce[1]. Our Study of 31 such patients is a keen observation of the causes and predictors leading to Readmission in this subset of patients. Maximum patients were in age group of 40-50 years implying increased reporting and presentation of complications in this age group. Similarly, in study conducted by Fish[1] they also found the increased readmission after ileostomy creation in patients in the age group of 40-59 years. According to study by Messaris[3], the Mean time duration between Discharge after ileostomy creation and Readmission of these subjects was found to be 20.64 days. On the other hand, the Mean time duration between ileostomy creation and Readmission of these subjects was found to be 28.03 days Though other causes of admission such as Stoma Obstruction, Surgical Site Infection also mentionable, major cause of readmission was dehydration (16.1%) with deranged Renal Function parameters (Mean Serum creatinine levels 2.6 mg/dl, Blood Urea levels of 85 mg/dl) also embolden our finding. This is akin to study conducted by W Li[4] wherein the main causes for readmission were organ/space infections (3.4%), small bowel obstruction/ileus (3.3%) and dehydration (3%). They concluded that dehydration associated with diverting ileostomy creation was relevant as an individual cause of readmission. However as per study findings of Vogel[5] the pooled incidence of readmissions due to dehydration was 6% within 30 days, with an all-cause readmission rate of 20% . Duration of readmissions for dehydration ranged from 2.5-9 days. Comparing these with our study in which the all cause readmission rate being 16.06% and Dehydration related readmission rate being 7.25%. As per the study conducted by Chen Lieu[2] where the 60-day re-admission rate was 29.3%, with dehydration present in 27.0% of these re-admissions, our study too had dehydration as being the predominant cause for readmission in these patients. The independent predictors of re-admission with dehydration in their study were renal impairment at discharge, codeine prescribed on discharge, Charlson Comorbidity Index and body mass index. Renal impairment has been highlighted in our study also as stated above. However Readmissions post ileostomy creation are well mentioned in the study conducted by Gregory Charak[6] in which the 60-day readmission rate was 36%. Of readmitted patients, 39% were admitted for dehydration. Other readmission reasons were infection (33%) and obstruction. ASA Score of 3 or more had increased number of patients involved in the study, implying that preoperative presence of systemic

Table 1: Patient's demographics, operative and postoperative factors

		Age Group < 60 Years	> 60 Years			Mean+Standard Deviation	P- Value
		Frequency	Percent	frequency	Percent		
Sex	Female	10	(32.3)	1	(3.2)	-	-
	Male	15	(48.4)	5	(16.1)	24.16	
BMI (Kg/m^2)		25	(80.6)	6	(19.4)	4.10	> 0.05
Personal History	Alcohol	11	(35.5)	4	(12.9)	-	> 0.05
	Tobacco	13	(41.9)	4	(12.9)	-	
	Smoking	5	(16.1)	5	(16.1)	-	
	3+	2	(6.5)	0	-		
Specific Comorbidities	Hypertension	15	(48.4)	2	(6.5)	-	> 0.05
	Diabetes	4	(12.9)	0	-		
	Respiratory Disease	11	(35.5)	4	(12.9)	-	
Cause of Stoma Formation	Colorectal Cancer	3	(9.7)	1	(3.2)	-	> 0.05
	Foreign Body In Rectum	1	(3.2)	0			
	Obstruction	10	(32.2)	1	(3.2)		
	Perforation (ILEAL)	10	(32.2)	3	(9.7)		
	Rectovaginal Fistula	1	(3.2)	0			
	Sigmoid Volvulus	0		1	(3.2)		
Indication for Readmission	Dehydration	12	(38.7)	2	(6.5)	-	-
	Obstruction	6	(19.3)	1	(3.2)		
	Surgical Site Infection	3	(9.7)	2	(6.5)		
	Retraction	2	(6.5)	0			
	Prolapse	2	(6.5)	0			
	Stenosis	0		1	(3.2)		
Pre Operative Shock	Present	12	(38.7)	3	(9.7)	-	> 0.05
	Absent	13	(41.9)	3	(9.7)		
ASA Score	-	25	(80.6)	6	(19.4)	3.00 0.51	> 0.05
Time Duration Between Stoma Formation and Readmission	-	-	-			28.68 13.68	-
Haemoglobin (g/dL)	-	25	(80.6)	6	(19.4)	9.91 1.64	> 0.05
Total Leukocyte Count (Cells/cumm)	-	25	(80.6)	6	(19.4)	11382.16 6030.39	0.01
Platelets (Lacs/cumm)	-	25	(80.6)	6	(19.4)	3.23 1.02	> 0.05
Total Protein (g/dL)		25	(80.6)	6	(19.4)	6.74 0.75	> 0.05
Serum Albumin (g/dL)	-	25	(80.6)	6	(19.4)	2.62 0.55	> 0.05
Blood Urea (mg/dL)	-	25	(80.6)	6	(19.4)	85.32 58.11	> 0.05
Serum Creatinine (mg/dL)	-	25	(80.6)	6	(19.4)	2.60 0.96	> 0.05
Serum Potassium (meq/L)	-	25	(80.6)	6	(19.4)	3.87 0.54	> 0.05
Serum Sodium (meq/L)	-	25	(80.6)	6	(19.4)	135.12 5.22	> 0.05

illnesses/comorbidities may have an impact on readmission of these patients undergoing ileostomy creation. Presence of preoperative shock is significantly associated with increased readmissions in these patients Total Leukocyte Count as statistically significant (p-value 0.01) in our study which suggests that elderly patients with sepsis (higher total Leukocyte counts) have larger chances of Readmission. Though our study along with these aforementioned studies give a detailed keen view on causes and deranged parameters of the patients undergoing readmission, ours also focused the light on management of these patients post readmission. Thus, this presented study is a keen observation on the readmitted patients post ileostomy creation, their causes and laboratory parameters, risk factors associated with them.

CONCLUSION

Readmission rates following ileostomy creation were significant (16.1%). The main factor leading to readmission was dehydration (45.2%) followed by Stoma obstruction (22.6%) and surgical site infection (16.1%). Elderly patients with sepsis (higher total Leukocyte counts) have larger chances of Readmission (p-value 0.01). To assist prevent dehydration and readmission, high-risk patients should be handled more conservatively as inpatients and thoroughly watched in the outpatient setting.

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