e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2023; 15(4); 668-676

Original Research Article

A Prospective Observational Study on Outcomes of Patients Undergoing Emergency Large Bowel Resection at a Tertiary Care Hospital

Zubin Parekh[1], Meenu Singh[2], Nitin Borle[3], Asma Khalife[4], Anirudh Chaphekar[5], Solaimuthu Rajagopal S[6], Rajendra Habib[7]

[1]Post Graduate Resident, Department of General Surgery, TNMC and BYL Nair Ch Hospital, Mumbai, Maharashtra.

[2]Post Graduate Resident, Department of General Surgery, TNMC and BYL Nair Ch Hospital, Mumbai, Maharashtra.

[3]Associate Professor, Department of General Surgery, TNMC and BYL Nair Ch Hospital, Mumbai Maharashtra

[4]Assistant Professor, Department of General Surgery, TNMC and BYL Nair Ch Hospital, Mumbai Maharashtra.

[5]Professor, Department of General Surgery, TNMC and BYL Nair Ch Hospital, Mumbai, Maharashtra.

[6]Senior Resident, Department of General Surgery, TNMC and BYL Nair Ch Hospital, Mumbai, Maharashtra.

[7]Post Graduate Resident, Department of General Surgery, TNMC and BYL Nair Ch Hospital, Mumbai, Maharashtra.

Received: 15-01-2023 / Revised: 25-02-2023 / Accepted: 03-04-2023

Corresponding author: Dr Zubin Parekh

Conflict of interest: Nil

Abstract

Background: Outcomes vary within the heterogeneous general surgical group of patients. However, it has been well established that emergency surgery has a high risk of postoperative complications other than death. The present study was undertaken to evaluate the outcomes of emergency large bowel surgery at a tertiary care hospital.

Methods: This prospective, observational study was conducted in 30 patients of age 18 years and above with large bowel resection. The study parameters included post-operative outcome, duration of ICU and ward stay, incidence of sepsis and septic shock, incidence of acute respiratory distress syndrome (ARDS), post-operative morbidity and mortality. Data thus collected was entered in excel sheets and analyzed using appropriate statistical test.

Results: Majority of patients were in their 6th decade of life with malepredominance. 43.33% were hypertensive and 26.67% were diabetic. Mean duration of ICU stay was 3.37±2.37 days and ward stay was 8.04±3.17 days. Most common post-operative complication was Sepsis (26.67%) followed by septic shock (20%) and ARDS (16.67%).

Conclusion: Patients should be assessed and post-operatively closely monitored, since it is likely that post-operative complications might be detected earlier, and so treated in time which might increase survival.

Keywords: Emergency Laparotomy, Morbidity, Mortality, Risk Factors.

Introduction

Emergency Large Bowel Resection represents a major part of general surgical emergency workload and 15-20% of patients with Large Bowel cancer presents with Acute obstruction requiring Emergency Surgery. [1,2] In 1985 an overall mortality rate was 17.2% for emergency Large Bowel Obstruction. [3] The literature has shown that morbidity and mortality in these patients depend on age, preoperative health status, operating surgeon, duration of surgical intervention and type of surgical procedure. [4,5] Several Changes have taken place in last three decades including implementation of structured surgical training with better training in the management of critically ill surgical patients, improvement in decision making and improved quality and availability of advanced imaging modalities.[6] In 1997, the overall postoperative mortality rate was reduced to 6.9%. [7]

The most common indication for EBLS is Colonic Carcinoma; which accounts for approximately 35% to 40% of all cases followed by Perforation which accounts for 30% to 35%. Additional causes are tumor obstruction, colitis, Bowel Ischemia, Volvulus, Anastomotic leak, abscess. Regardless of the cause of the blockage, the clinical manifestations of large bowel obstruction include the failure to pass stool and flatus associated with increasing abdominal distention and cramping abdominal pain. [8] Fever, severe tenderness, and abdominal rigidity are ominous signs that suggest peritonitis secondary to perforation. The cecum is the area most likely to perforate. [9] Diagnostic strategies are needed to aid in the diagnoses, and computed tomography has become the most reliable imaging modality in the emergency department. [10] Initial therapy in patients with suspected large-bowel obstruction (LBO) includes volume resuscitation, appropriate preoperative broad-spectrum antibiotics, and timely surgical consultation and management. The present study was undertaken to evaluate the outcomes of emergency large bowelsurgery at a tertiary care hospital.

Material and Method:

This prospective, observational study was conducted in the Tertiary Care Hospital over a period of 2 years after obtaining approval from the institutional ethics committee. The study included total 30 patients fulfilling the following inclusion and exclusion criteria.

Inclusion Criteria:

1. All patients more than 18 years of age with Large Bowel resection.
2. All patients undergoing Emergency laparotomy in view of Large Bowel Resection

Exclusion Criteria:

1. Patients less than 18 years of age.
2. Pregnant females
3. All Exploratory Laparotomies with small bowel resection or anastomosis

In this study, the records of patients who have undergone Emergency Large Bowel resection were studied by a prospective analysis. The demographic profile with relevant Surgical details and Postoperative outcomes were recorded in case record proforma. The study parameters included post-operative outcome, duration of ICU and ward stay, incidence of sepsis and septic shock, incidence of acute respiratory distress syndrome (ARDS), post-operative morbidity and mortality. Data thus collected was entered in excel sheets and analyzed using appropriate statistical test.

Statistical analysis:

The data entry was done in the Microsoft EXCEL spreadsheet and the final analysis

was done with the use of Statistical Package for Social Sciences (SPSS) software, IBM manufacturer, Chicago, USA, ver 25.0. The quantitative data were presented as the means±standard deviation (SD) and as median with 25th and 75th percentiles (interquartile range). The association of the variables which were quantitative in nature were analysed using the independent t test. The association of the variables which were qualitative in nature were analysedusing Chi-Square test. If any cell had an expected value of less than 5 then Fisher's exact test was used.

Results

The mean age of the study patients was 57.9±14.4 years with the age ranging from 30-85 years. Majority of the patients were in the age group of 61-70 years.(Table 1)

Table 1: Distribution of age(years) of study subjects

Age(years)	Frequency	Percentage
30-40	6	20.00%
41-50	5	16.67%
51-60	3	10.00%
61-70	12	40.00%
>70	4	13.33%
Mean ± SD	57.9 ± 14.4	
Median (25th-75th percentile)	61(47-67.5)	
Range	30-85	

In the present study, 66.67% patients were male and 33.33% patients were females. (Figure 1)

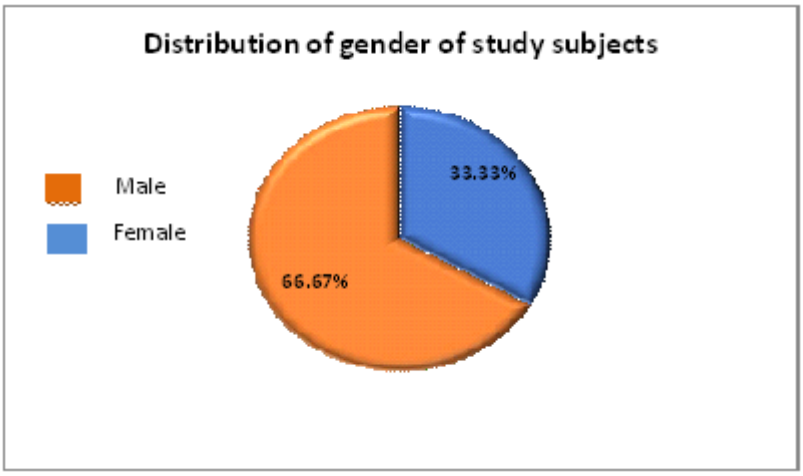

Figure 1: Distribution of gender of study subjects

The most common co-morbidity present in the study patients was hypertension (43.33%) followed by diabetes mellitus (26.67%). Other co-morbidities observed in the present study included Ischemic heart disease, Bronchial asthma/COPD, Past history of tuberculosis, Chronic kidney disease, and Chronic liver disease.

Table 2: Distribution of co-morbidities of study patients

Co-morbidities	Frequency	Percentage
Diabetes mellitus	8	26.67%
Hypertension	13	43.33%
Ischemic heart disease	2	6.67%
Bronchial asthma/COPD	2	6.67%

Past history of tuberculosis	2	6.67%
Chronic kidney disease	1	3.33%
Chronic liver disease	1	3.33%

The mean duration of ICU stay was 3.37±2.37 days and ward stay was 8.04±3.17 days in the present study. (Figure 2)

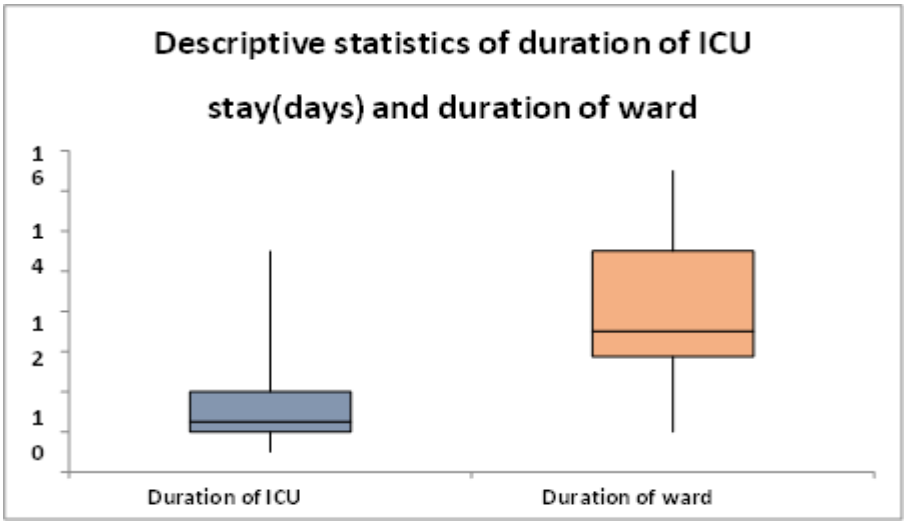

Figure 2: Descriptive statistics of duration of ICU and ward stay (days) of study subjects.

The most commonly observed post-operative complications was Sepsis (26.67%) followed by septic shock (20%) and ARDS (16.67%). Other complications included MODS, AKI, burst abdomen, stomach complication, surgical site infection and pulmonary embolism in descending order. (Figure 3)

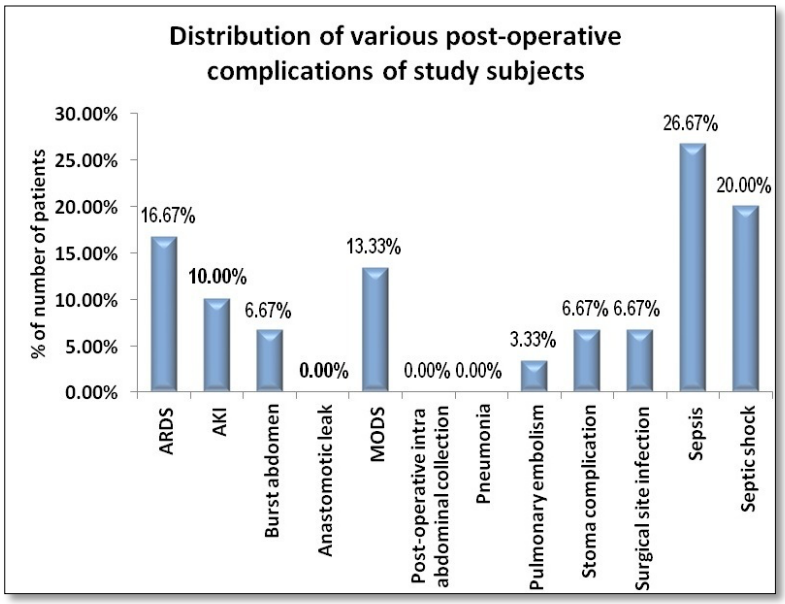

Figure 3: Distribution of various post-operative complications in study patients

The cause of death in majority of the study patients was sepsis with septic shock (50%). Other causes of death observed in the present study were ARDs with septic shock, MODS, MODS with sepsis, and Type 1 respiratory failure. (Table 3)

Table 3: Distribution of cause of death of study patients

Cause of death	Frequency	Percentage
ARDs with septic shock	1	12.50%
MODS	1	12.50%
MODS with sepsis	1	12.50%
Sepsis with septic shock	4	50.00%
Type 1 respiratory failure	1	12.50%
Total	8	100.00%

Distribution of post-operative complications was comparable with co-morbidities. {Diabetes mellitus:- No(45.45%) Vs Yes(12.50%) (p value=0.199), Hypertension:-No(41.18%) VsYes(30.77%) (p value=0.708), Ischemic heart disease:- No(35.71%) Vs Yes(50%) (p value=1), Bronchial asthma/COPD:- No(39.29%) Vs Yes(0%) (p value=0.52), Past history of tuberculosis:- No(35.71%) Vs Yes(50%) (p value=1), Chronic kidney disease:- No(34.48%) Vs Yes(100%) (p value=0.367), Chronic liver disease:- No(34.48%) Vs Yes(100%) (p value=0.367)}.These differences were statistically significant. (Table 4)

Table 4: Association of co-morbidities with post-operative complications.

Co-morbidities	With post-operative complications(n=11)	Without post- operative complications(n=19)	Total	P value
Diabetes mellitus				
No	10 (45.45%)	12 (54.55%)	22 (100%)	0.199*
Yes	1 (12.50%)	7 (87.50%)	8 (100%)	
Hypertension				
No	7 (41.18%)	10 (58.82%)	17 (100%)	0.708*
Yes	4 (30.77%)	9 (69.23%)	13 (100%)	
Ischemic heart disease				
No	10 (35.71%)	18 (64.29%)	28 (100%)	1*
Yes	1 (50%)	1 (50%)	2 (100%)	
Bronchial asthma/COPD				
No	11 (39.29%)	17 (60.71%)	28 (100%)	0.52*
Yes	0 (0%)	2 (100%)	2 (100%)	
Past history of tuberculosis				
No	10 (35.71%)	18 (64.29%)	28 (100%)	1*
Yes	1 (50%)	1 (50%)	2 (100%)	
Chronic kidney disease				
No	10 (34.48%)	19 (65.52%)	29 (100%)	0.367*
Yes	1 (100%)	0 (0%)	1 (100%)	
Chronic liver disease				
No	10 (34.48%)	19 (65.52%)	29 (100%)	0.367*
Yes	1 (100%)	0 (0%)	1 (100%)	

Distribution of mortality was comparable with co-morbidities. {Diabetes mellitus:- No(31.82%) Vs Yes(12.50%) (p value=0.391), Hypertension:- No(23.53%) Vs Yes(30.77%) (p value=0.698), Ischemic heart disease:- No(25%) Vs Yes(50%) (p value=0.469), Bronchial asthma/COPD:- No(28.57%) Vs Yes(0%) (p value=1), Past history of tuberculosis:- No(25%) Vs Yes(50%) (p value=0.469), Chronic kidney disease:- No(24.14%) Vs Yes(100%) (p value=0.267), Chronic liver

disease:- No(24.14%) Vs Yes(100%) (p value=0.267)}.(Table 5)

Table 5: Association of co-morbidities with outcome in study patients

Co-morbidities	Died(n=8)	Survived(n=22)	Total	P value
Diabetes mellitus				
No	7 (31.82%)	15 (68.18%)	22 (100%)	0.391*
Yes	1 (12.50%)	7 (87.50%)	8 (100%)	
Hypertension				
No	4 (23.53%)	13 (76.47%)	17 (100%)	0.698*
Yes	4 (30.77%)	9 (69.23%)	13 (100%)	
Ischemic heart disease				
No	7 (25%)	21 (75%)	28 (100%)	0.469*
Yes	1 (50%)	1 (50%)	2 (100%)	
Bronchial asthma/COPD				
No	8 (28.57%)	20 (71.43%)	28 (100%)	1*
Yes	0 (0%)	2 (100%)	2 (100%)	
Past history of tuberculosis				
No	7 (25%)	21 (75%)	28 (100%)	0.469*
Yes	1 (50%)	1 (50%)	2 (100%)	
Chronic kidney disease				
No	7 (24.14%)	22 (75.86%)	29 (100%)	0.267*
Yes	1 (100%)	0 (0%)	1 (100%)	
Chronic liver disease				
No	7 (24.14%)	22 (75.86%)	29 (100%)	0.267*
Yes	1 (100%)	0 (0%)	1 (100%)	

Discussion

The general surgical population is broad group of patients suffering from a wide range of conditions and existing co-morbidities. Outcomes vary within this very heterogeneous group of patients. However, it has been well established that emergency surgery has a high risk of postoperative complications other than death, ranging from relatively minor complications such as ileus to severe complications, such as wound infection or stroke. The presence of co-existing medical disease is of great importance for the prognosis of patients undergoing emergency surgery. Age, ASA class, functional status, and presence of sepsis have been shown to predict death, and several studies have tried to develop scoring systems in order to be able to predict outcome by scoring pre-operative status however, literature is not consistent concerning the impact of comorbidities in general as demonstrated in a study done by Fukuda N et al [11]. We found the presence of diabetes mellitus, hypertension, cerebrovascular disease, cardiopulmonary conditions, chronic nephropathy, and malignancy to influence the 30-day mortality.

In the present study, 40% patients belonged to age group 61-70 years followed by 30-40 years seen in 20%. The mean age of the study patients was 57.9±14.4 years with median age of 61 years.(Table 1) Similar observations were made by Lavanchy JL et al [12] who found the median age of 58.1 years in their study. However, Manoj P et al [13] have observed the mean age was 42.99 years in their study which is less than mean age in present study. The present study showed male preponderance with 66.67% males and 33.33% females.(Figure 1) Manoj P et al [13] also found that there were 76.2% male and 23.8% females in their study.

In the present study, majority (43.33%) of patients had hypertension followed by diabetes mellitus, ischemic heart disease, bronchial asthma/COPD, past history of tuberculosis, chronic kidney disease and chronic liver disease.(Table 2) However, the study by Manoj P et al [13] demonstrated that the most common comorbidity in the patients was diabetes mellitus (19.2%), followed by hypertension (15.1%), obstructive pulmonary disease (7.3%), malignancy (5.6%), and ischemic heart disease (4%). On the other hand, study done by Ng HJ et al [14] demonstrated that gastrointestinal conditions (31.7%), followed by cardiovascular co- morbidities (20.8%) were common medical co-morbidities in their study patients.

In the present study, mean duration of ICU stay and ward stay of the study patients was 3.37±2.37 and 8.04±3.17 days with median of 2.5 and 7 days respectively.(Figure 2) Similar observations were made by Manoj P et al [13] who observed that the length of hospital stay was on an average of 6.86% days in their study, while Pal S et al [15] demonstrated that the median duration of postoperative hospital stay was 10 days.

In our study, in 26.67% patients, sepsis was present followed by septic shock seen in20%, ARDS seen in 16.67%, MODS seen in 13.33%, AKI seen in 10%, burst abdomen seen in 6.67%, stoma complication seen in 6.67%, surgical site infection seen in 6.67% and pulmonary embolism seen in 3.33%.(Figure 3) The most common surgical complication observed in the study by Manoj P et al[13] was wound infection, followed by wound dehiscence and anastomotic leakage. On the other hand, Pal S et al [15] demonstrated that the overall morbidity included major wound sepsis with or without wound dehiscence (27; 37.5%), fever (20; 27.8%), adhesive intestinal obstruction (8.3%), pelvic sepsis (6.6%), ileostomy-related complications (6.6%), blow out of Hartmann's pouch (6.6%) and continued rectal bleeding (3.3%).

In the present study, cause of death was sepsis with septic shock in 50% of the patients.(Table 3) The causes of death in the study done by Pal S et al [15] included septicaemia, severe chest infection with respiratory failure, disseminated intravascular coagulation, diabetic ketoacidosis, metabolic encephalopathy and upper gastrointestinal bleeding (stress bleeding). Percentage of complications in patients who were not having diabetes was 45.45%, and those with having diabetes it was 12.50% (p value= 0.199). [16]

Percentage of complications in patients who were not having hypertension was 41.18%, and those with having hypertension it was 30.77% in the present study (p value= 0.708). Percentage of complications in patients who were not having ischemic heart disease was 35.71%, and those with having ischemic heart disease it was 50% (p value= 1). Percentage of complications in patients who were not having bronchial asthma was 39.29%, and those with having ischemic heart disease it was 0% (p value= 0.52). Percentage of complications in patients who were not having past history of tuberculosis was 35.71%, and those with having past history of tuberculosis it was 50% (p value= 1). Percentage of complications in patients who were not having chronic kidney disease was 34.48%, and those with having chronic kidney disease it was 100% (p value= 0.367). Percentage of complications in patients who were not having chronic liver disease was34.48%, and those with having chronic liver disease it was 100% (p value= 0.367).

In the present study, percentage of mortality in patients who were not having diabetes was 31.82%, and those with having diabetes it was 12.50% (p value=0.391). Percentage of mortality in patients who were not hypertensive was 23.53%, and those with having

hypertension it was 30.77% (p value=0.698). Percentage of mortality in patients who were not having ischemic heart disease was 25%, and those with having ischemic heart disease it was 50% (p value=0.469). Percentage of mortality in patients who were not having bronchial asthma/COPD was28.57%, and those with having bronchial asthma/COPD it was 0% (p value=1). Percentage of mortality in patients who were not having past history of tuberculosis was 25%, and those with having past history of tuberculosis it was 50% (p value=0.469). Percentage of mortality in patients who were not having chronic kidney disease was 24.14%, and those with having past history of chronic kidney disease it was 100% (p value=0.267)Percentage of mortality in patients who were not having chronic liver disease was 24.14%, and those with having past history of chronic liver disease it was 100% (p value=0.267).

Conclusion

The emergency surgical population is greatly heterogeneous and preventing or minimizing cardiopulmonary complications demands the optimal pre and post-operative surveillance and care. Patients should be assessed and post-operatively closely monitored, since it is likely that post-operative complications might be detected earlier, and so treated in time which might increase survival. Clavien-Dindo classification can be used for monitoring post-operative morbidity and mortality and there is a need for high quality prospective and multimodal intervention studies in order to improve patient care in this large group of patient.

References

1. Barrow E, Anderson ID, Varley S et al. Current UK practice in emergency laparotomy. Ann R Coll Surg Engl. 2013; 95: 599–603.
2. Trompetas V. Emergency management of malignant acute left-sided colonic Obstruction. Ann R Coll Surg Engl. 2008;90:181–6.
3. Koruth NM, Hunter DC, Krukowski ZH, Matheson NA. Immediate resection in emergency large bowel surgery: a 7 year audit. Br J Surg. 1985; 72:703–7.
4. Scott-Conner CE, Scher KS. Implications of emergency operations on the colon. Am J Surg. 1987; 153:535–40.
5. Darby CR, Berry AR, Mortensen N. Management variability in surgery for Colorectal emergencies. Br J Surg. 1992; 79:206–10.
6. Current outcomes of emergency largebowel surgery HJ Ng1 M Yule2 M Twoon2 NR Binnie1 EH Aly1Ann R Coll Surg Engl. 2015; 97: 151–156.
7. Isbister W, Prasad J. Emergency large bowel surgery: a 15-year audit. Int J Colorect Dis. 1997*;* 1:285-90.
8. Medscape Article by Christy Hopkins, MD, MPH Steven C Dronen, MD, FAAEM.
9. Slam KD, Calkins S, Cason FD. LaPlace's law revisited: cecal perforation as an unusual presentation of pancreatic carcinoma. World J Surg Oncol. 2007 Feb 2. 5:14.
10. Jaffe T, Thompson WM. Large-Bowel Obstruction in the Adult: Classic Radiographic and CT Findings, Etiology, and Mimics. Radiology. 2015;275 (3): 651-63.
11. Fukuda N, Wada J, Niki M, Sugiyama Y and Mushiake H. Factors predicting mortality in emergency abdominal surgery in the elderly. World J Emerg Surg. 2012;7(1):12.
12. Lavanchy JL, Dubuis JB, Osterwalder A, Winterhalder S, Haltmeier T, Candinas D et al. Impact of Inter-Hospital Transfer on Outcomes in Patients Undergoing Emergency Abdominal Surgery: A Tertiary Referral Center's Perspective. World J Surg. 2021 Sep;45(9):2703-2711.
13. Manoj P, Shashikumar HB, Fathimath Shihana. Mortality and morbidity rates in patients undergoing emergency

laparotomy: An analysis in a tertiary care hospital. Asian Journal of Medical Sciences. 2022;13(3):132–8.
14. Ng HJ, Yule M, Twoon M, Binnie NR, Aly EH. Current outcomes of emergency large bowel surgery. The Annals of The Royal College of Surgeons of England. 2015;97(2):151–6.
15. Pal S, Sahni P, Pande GK, Acharya SK, Chattopadhyay TK. Outcome following emergency surgery for refractory severe ulcerative colitis in a tertiary care centre in India. BMC Gastroenterol. 2005 Nov 30; 5:39.
16. Kafaji M. S. A. A., & Alsaadi Z. H. Pinworms Infection: Review. Journal of Medical Research and Health Sciences, 2022; 5(8); 2182–2189.