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AN OBSERVATIONAL STUDY ON SPECTRUM OF POST-OPERATIVE COMPLICATIONS IN EMERGENCY LAPAROTOMIES IN A TERTIARY HEALTH CARE CENTRE

General Surgery

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ABSTRACT

Introduction: An exploratory laparotomy is carried out in circumstances where the need for an operation is recognized but where a definitive diagnosis cannot be made until the abdomen is opened. Most exploratory laparotomies are performed in the emergency situations, where the value of thorough investigations has to be balanced against any worsening which may occur in the patient's general condition during the unavoidable delay. The study was conducted to identify the spectrum of postoperative complications in the form of outcome in emergency laparotomy so that effective measures. **Methodology:** This is an observational descriptive study conducted in the department of Surgery, at a well reputated tertiary medical college and hospital catering patients from middle and east zone of India. 100 patients included in this study. The study duration was 1 years. The post-operative complications were documented. Persistent postoperative fever (>48 hrs), postoperative nausea-vomiting & respiratory tract infections (pneumonia) were monitored regularly. **Results:** The results have been analysed according to the standard statistical methods to document the data according to various parameters taken into account in assessing the patients. A total of 100 patients who fulfilled the inclusion and the exclusion criteria were taken in the study. Complications occurred among 22% of patients. The most common complication observed was post-operative fever (21%) followed by surgical site infection (16%), PONV (10%), respiratory tract infection (5%), dyselectrolemia (4%). **Conclusion:** The spectrum of complications: post-operative fever, surgical site infection, Post-operative nausea and vomiting (PONV), Respiratory tract infection, Dyselectrolemia, Prolonged Paralytic Ileus, Wound Dehiscence, Anastomotic Leak, Burst abdomen, Intra-abdominal bleeding & Death but the commonest complication observed was postoperative fever in followed by surgical site infection. However, the small size of the study population prevented us from arriving at definitive conclusions.

KEYWORDS

Peritonitis, SSI, PONV, Paralytic Ileus

INTRODUCTION :

One of the commonly performed operations by surgeons is emergency laparotomy [1]. The Greek word laparos (soft or loose) is used for 'the soft part between the ribs above and hip below, and word tome is used for 'a cutting' i.e. cutting into that area. An exploratory laparotomy is carried out in circumstances where the need for an operation is recognized but where a definitive diagnosis cannot be made until the abdomen is opened. Whenever feasible, however, an effort should be made to arrive at an exact, or at least a provisional diagnosis before surgery, in collaboration with imaging modalities [2]. Most exploratory laparotomies are performed in the emergency situations, where the value of thorough investigations has to be balanced against any worsening which may occur in the patient's general condition during the unavoidable delay. A short delay, during which both active resuscitation and preliminary investigations are performed, is however usually helpful, as surgery on severely shocked or septic patients carries a high mortality. Complications after emergency laparotomy are very common. Despite advances in surgical techniques, antimicrobial therapies and intensive care supports; management after emergency laparotomy continues to be highly demanding, and sometimes may be difficult and complex. The study was conducted to identify the spectrum of postoperative complications in the form of outcome in emergency laparotomy so that effective measures could be suggested to reduce them and subsequently to reduce the morbidity and mortality related with the complications.

MATERIALS & METHODOLOGY :

This is an observational descriptive study conducted in the department of Surgery, at a well reputated tertiary medical college and hospital catering patients from middle and east zone of India. 100 patients included in this study were the patients attending outdoor and emergency also some pre-diagnosed cases referred from peripheral hospital after taking written informed consent and ethical clearance certificate.The study duration was 1 years from 2019-2020. Patients with perforative peritonitis, intestinal obstruction, blunt trauma abdomen with suspected organ injury were included in this study while patients having preoperative co-morbidities like diabetes mellitus, hypertension, asthma, COPD, immunodeficiency, coagulopathy, organ failure etc. were excluded. All the cases were initially admitted in the 'General Surgical Ward' from casualty and outpatient department. A detailed history and clinical examination were conducted. Pre-operative baseline investigations like- Complete Blood Count, Urinalysis, Serum Urea/Creatinine, Serum Electrolytes, Chest X-ray, ECG, Hepatitis B, Hepatitis C profile and Random Blood Sugar was done. Then abdominal radiographs and ultrasonography was done. Blood was also sent for grouping and cross matching as necessary. After initial resuscitation pre-anesthetic assessment was made and written / informed consent was taken after counseling regarding the condition of the patient and the possible outcomes. Under general anesthesia all the patients were opened through a midline abdominal incision. After dealing with the primary pathology a thorough peritoneal lavage was performed with copious amounts of normal saline. A drain was placed in the peritoneal cavity. The abdomen was closed en-mass by Polypropylene No-1 suture and skin was closed separately with Monofilament Polyamide No-2. At the conclusion of the procedure, a sterile dressing was applied to the wound.Post-operatively, all patients were given intravenous Ceftriaxone and Metronidazole. Antibiotics were changed depending on sensitivity, if patient developed signs of sepsis or wound infection.The post-operative complications were documented. Persistent postoperative fever (>48 hrs), postoperative nausea-vomiting & respiratory tract infections (pneumonia) were monitored regularly. Examination of the wound was started from the 2nd postoperative day.The clinical signs of redness, oedema, serosanguinous discharge and presence of pus or discharge of intestinal contents (enterocutaneous fistula) were noted. The abdominal drain content was also examined daily for blood, pus and intestinal contents. Following discharge, patients were followed up for 28 days and examined for any complications.

RESULTS & ANALYSIS :

The results have been analysed according to the standard statistical methods to document the data according to various parameters taken into account in assessing the patients. A total of 100 patients who fulfilled the inclusion and the exclusion criteria were taken in the study. Among them 88 (88%) were males and 12(12%) were females. The occurances of complications were seen more in male (22.72%) than female (16.67%). The advanced age (>40 yrs.) is associated with increased incidence of post-operative complications. Moreover, advanced age is associated with co-morbid illness (es) which in itself increase the risk. Though the majority of the patients were in the age range of 31- 40 years, the rate of complications is seen more in the range of 41 - 50 years. The majority of cases were of perforative peritonitis (50%) [Figure 2], while others were acute intestinal obstruction (33%)[Table 1] and abdominal trauma (17%) [Figure 3,4]. Duodenal perforation (28%) was the most common indication for

laparotomy followed by sigmoid volvulus (12%) [Figure 1], appendicular perforation (11%), splenic injury (10%), band adhesions (9%) and others. Complications occurred among 22% of patients. The most common complication observed was post-operative fever (21%) followed by surgical site infection (16%), PONV (10%), respiratory tract infection (5%), dyselectrolemia (4%) and others [Table 2]. Two patients developed anastomotic leak and another two patients developed wound dehiscence [Figure 5,6]. One patient had intra-abdominal bleeding. Two patients died postoperatively during the study period while in the hospital. Septicemia was the cause of death in all 2 cases. Anastomotic leak, respiratory tract infections and surgical site infection with burst abdomen lead to septicemia.

DISCUSSION :

The emergency laparotomy for acute abdomen is a foremost test of the surgical skills of a surgeon. Postoperative care is as important as the preoperative preparation for a successful outcome. Deficient care in either may produce unacceptable results irrespective of the standard of surgery. The main intend of meticulous postoperative care is early detection and immediate treatment of postoperative complications.In this study, postoperative complications in emergency laparotomies were seen in 22% patients. In this study group, out of the 100 patients , 88 were male & 12 were females. The occurance of complicaions are more in male (22.72%) than female (16.67%) and is increased with advanced age (more than 40 years) & this finding is almost similar with many reviews[3,4,5,6].We observed that post-operative fever (21%) is the commonest complication. It was followed by surgical site infection (16%), PONV (10%), respiratory tract infection (5%), dyselectrolemia (4%) and others. Jawaid et al documented postoperative fever as the commonest complication at 18.2% and it was followed by wound infection at 11.4% [7]. However, this study did not separate emergency cases from elective cases. In another study by Murtaza et al common complications were reported to be postoperative fever (21.6%), wound infection (21.6%) and postoperative nausea and vomiting (13.2%)[8]. In one study from India, the major causes of postoperative morbidity of patients of perforative peritonitis were found to be respiratory tract infections (28%), surgical site infections (25%), septicemia (18%) and dyselectrolemia (17%) [9].Fever is frequent among postoperative patients [10]. In our study the most common complication observed was postoperative fever in 21% patients. Most early postoperative fever (Temperature above 38ºC (100.4ºF) during first 48 hours) is caused by the inflammatory stimulus of surgery and resolves spontaneously [11]. However, postoperative fevers can also be a sign of a serious complication. Pyrexia within 48 hours of surgery may be due to pulmonary atelectasis. Between 48 hours and five days, pyrexia may be the result of thrombophlebitis or infection of the urinary tract or the chest, and more than five days after surgery, a wound infection or anastomotic breakdown should be suspected [12]. A study by Barie et al among critically ill surgical patients showed that 26% of them developed postoperative fever [13]. A study by Deshmukh et al, in the background of rural India found the rate as 8% [14]. Postoperative nausea and vomiting (PONV) are among the most common adverse events after surgery and anesthesia [15]. Compared with other postoperative complications like wound infection, anastomotic leak and septicemia, PONV is of minor medical importance; it almost never kills. However, PONV may be very distressing for patients. The overall incidence of PONV is about 30 % but can be as high as 70 % in high-risk patients [16]. Most episodes of postoperative nausea and vomiting resolve within 24 hours. In our study 10% of patient suffered from PONV after 24 hours of surgery. The results are less than the data (13.2%) documented by Murtaza et al in a peripheral hospital based study in Pakistan. Postoperative pulmonary complications are common and a major cause of overall perioperative morbidity and mortality [17]. Five (5%) patients in our study developed respiratory tract infection. Jawaid et al and Murtaza et al documented it as 7% and 2.4% respectively. A study by Neto et al shows the incidence of postoperative respiratory complications was 11.7% [18]. In an Indian study the complication rate was found 6 % . According to data in various literatures, the incidence of pneumonia in adults submitted to general surgery ranges from 18 % to 68 %. In our study, dyselectrolemia was noted in 4% patient. In a north India based study Jhobta et al found the rate of dyselectrolemia was 17% among the post-operative patient of perforative peritonitis . In another study conducted by Deshmukh et al in Nagpur the rate of dyselectrolemia was found to be 4% [19] .After any surgery different areas of the gastrointestinal tract resume function at different times. The small bowel is affected only transiently whereas the stomach can take from 24-48 hours to recover. The colon takes the longest to resume normal motility patterns, requiring 48-72 hours. If postoperative ileus lasts longer than 3 days, it is thought to be complicated, and may be termed postoperative paralytic ileus. In our study 4% of patients developed this complication. In Jawaid et al's study 2.9% of patients developed this complication. Postoperative wound related complications have a major contribution to the postoperative morbidities. Surgical site infection (SSI) and wound dehiscence place a high burden on hospital resources, by increasing the health care cost due to prolonged hospital stay. Wound dehiscence is a very serious complication of abdominal surgery, with high mortality rate and no single cause being responsible rather it is a multifactorial problem. In our study the surgical site infection and wound dehiscence were 16% and 2% respectively. Whereas Murtaza et al documented surgical site infection wound dehiscence were 21.6% and 4.8% respectively. On the other hand, Jawaid et al documented these were as 11.4% and 0.2% respectively not separating emergency and elective laparotomies. Pavlidis et al has reported that abdominal wound dehiscence occurred in 89 cases out of 19,206 major abdominal operations (0.5%). In an Indian study the rate of SSI was found 16 % with no case of wound dehiscence.The ultrasonography abdomen has a definitive role in detecting the postoperative intra-abdominal complications like hematoma or abscess formation. One case of intra-abdominal bleeding was seen in this study. On the other hand, two cases had anastomotic disruption which had fatal results. The results are similar to those documented by Murtaza et al.Mortality is the worst outcome of surgical interventions. In our study mortality was 2%. Two patients died of anastomotic leak and respiratory tract infection leading to septicemia within 7th post-op day. Common factors in all the deaths were late presentation, extremes of age, low preoperative hemoglobin, poor nutrition, and septicemia. In the studies conducted by Murtaza et al and Jawaid et al mortality rate were found 8.4% and 0.9% respectively. In the study conducted by Deshmukh et al, the overall mortality observed 6%.

SUMMARY AND CONCLUSION:

The above prospective observational study comprised of 100 patients in the surgical wards of at Tertiary Health Care center underwent emergency laparotomy.Collection, tabulation and analysis of the data revealed a whole spectrum of complications seen following emergency laparotomy. The following are the inferences arrived after the study – prevalence of post-operative complications after emergency laparotomies is more in male patients as compared to females,incidence of complications increases with advanced age, the majority of the patients were of perforative peritonitis. The spectrum of complications: post-operative fever, surgical site infection, Post-operative nausea and vomiting (PONV), Respiratory tract infection, Dyselectrolemia, Prolonged Paralytic Ileus, Wound Dehiscence, Anastomotic Leak, Burst abdomen, Intra-abdominal bleeding & Death but the commonest complication observed was postoperative fever in followed by surgical site infection. However, the small size of the study population prevented us from arriving at definitive conclusions. Larger studies have to be performed to get more information about the varying complications and arrive at definitive conclusions.

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Figures

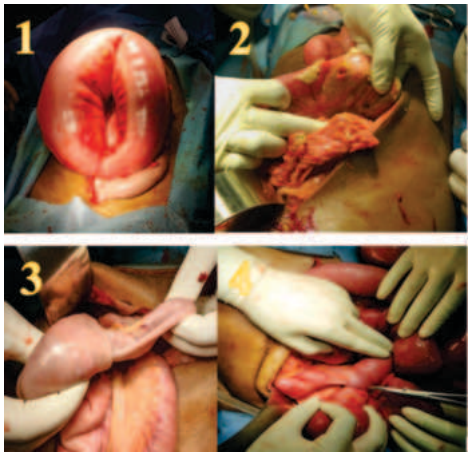

Figure 1 – Volvulus ; **Figure 2 –** Perforation Peritonitis; **Figure 3,4 –** Intestinal Obstruction, Blunt trauma abdomen, **Figure 5,6 –** Wound dehiscence

Table 1 - : Indications For Laparotomy:

A. Perforative Peritonitis.	
a) D1 perforation	28
b) Appendicular Perforation	11
c) Enteric Ileal Perforation	7
d) Gastric Perforation	4
	50
B. Acute Intestinal Obstruction.	
a) Sigmoid Volvulus	12
b) Band Adhesions	9
c) Colonic Growth	8
d) Intussusception	3
e) Inflammatory Stricture	1
	33
C. Abdominal Trauma.	
a) Splenic injury	10
b) Liver injury	3
c) Ileal Perforation	2
d) Penetrating injury causing Omental tear	1
e) Penetrating injury to lower rectum	1
	17

Table 2: Postoperative complications (n = 100)

Complications	Percentage (%)
Post-Operative Fever (POF)	21
Surgical Site Infection (SSI)	16
Postoperative Nausea Vomiting (PONV)	10
Respiratory tract infection (RTI)	5
Prolonged Paralytic Ileus	4
Dyselectrolemia	4
Wound Dehiscence	2
Anastomotic Leak	2
Burst Abdomen	1
Intra-abdominal bleeding	1
Death	2

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