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A PROSPECTIVE STUDY OF CLINICAL OUTCOME OF SMALL BOWEL PERFORATION

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ABSTRACT

Context: Small bowel perforation is one of the commonest surgical emergencies in our limited resource rural area. **Aims:** To review the common aetiologies, diagnostic dilemmas and challenges to treat small bowel perforations in the emergency. **Settings and Design:** This was a prospective study of 66 patients with small bowel perforation managed in a single surgical unit at Krishna institute of medical sciences **Materials and Methods:** Demographic data, clinical presentation, radiological findings, laboratory reports, operative notes, surgical procedure performed, postoperative progress, complications, hospital stay, mortality notes of all the patients were meticulously entered in a previously prepared proforma for this purpose. **Results: 54** (81.8%) patients were males and 12 (18.2%) were females with ages ranging from 10 to 80 years. Abdominal pain and distension was the commonest presenting symptom in all 66 (100%) patients. 34 (51.5%) patients had evidence of pneumoperitoneum on erect plain X-ray chest and abdomen. 46 (70%) patients were of duodenal perforation, 6 (9%) of jejunal whereas 14 (21%) had a single ileal perforation. Anterior wall perforation in the duodenum due to nonsteroidal anti-inflammatory drugs (NSAIDs)/steroid was the commonest etiology in 42 (63.6%) patients. The mean hospital stay was 22 days and there were two mortalities. **Conclusions:** Small bowel perforations in rural areas like ours have etiological factors very different from counterparts in the West. Unregulated and indiscriminate use of NSAIDs/steroids still accounts for the high rate of duodenal perforation in our rural area. Insanitary conditions lead to endemic typhoid infections and perforations causes which have been eliminated from developed countries.

INTRODUCTION

Small bowel perforations which can be broadly classified into traumatic and spontaneous continue to remain one of the commonest surgical emergencies in rural India. Most patients present late with sepsis and multiorgan failure leading to a high morbidity and mortality. The present study was conducted on 33 patients who presented with small bowel perforation between march 2018 and april 2019 in a single surgical unit at Krishna institute of medical sciences to review the etiology, dilemmas in diagnosis, modalities of treatment for an improved outcome in these moribund patients

MATERIALS AND METHODS

This was a prospective study conducted on 33 patients who presented in the surgical casualty of Krishna institute of medical sciences as bowel perforation between march 2018 and april 2019 Only those patients who eventually turned out to be small bowel perforation were included in this study. All the data was compiled from a single surgical unit.

The diagnosis of bowel perforation was established by clinical features of perforation peritonitis. Pneumoperitoneum was evidenced by collection of free air under the right dome of the diaphragm on erect plain X-ray of the chest and abdomen and the presence of free fluid and intraperitoneal gas on abdominal ultrasonography gave further confirmation to the diagnosis. Rarely ultrasound guided intraperitoneal aspiration of bile or faecal matter was used to corroborate the diagnosis in cases of radiological dilemmas. Contrast- enhanced computed tomography (CECT) abdomen was used only in stable abdominal trauma patients to exclude other intraabdominal injuries.

- Blood investigations necessarily included complete blood count, random blood sugar, serum sodium and potassium, serum creatinine, informed HIV, hepatitis B surface antigen (HBsAg), hepatitis C virus (HCV) testing.
- Preoperatively all patients were rehydrated with intravenous fluids. They also received broad spectrum antibiotics, nasogastric aspiration and urethral catheterization.
- All patients were subjected to a midline exploratory laparotomy under general, epidural, or spinal anesthesia as deemed appropriate by the anesthetist. Intraperitoneal fluid and pus was sent for culture and sensitivity. A thorough survey of the peritoneal cavity followed by appropriate surgical

intervention and copious lavage with normal saline was done. The abdomen was closed in a single layer using prolene no. 1 over perforated tube drains usually two in number in the paracolic gutter and pelvis. Skin was closed with interrupted nylon no. 2-0. Most patients required a stay of 1-2 days in the Intensive Care Unit. Nasogastric tubes were removed with return of bowel sounds and when the patient passed flatus. Abdominal drains and Foley's catheter were removed variably between 3 and 5 days as considered appropriate.

Demographic data, clinical presentation, radiological findings, laboratory reports, operative notes, surgical procedure performed, postoperative progress, complications, hospital stay mortality notes were meticulously entered in a previously prepared proforma for this purpose.

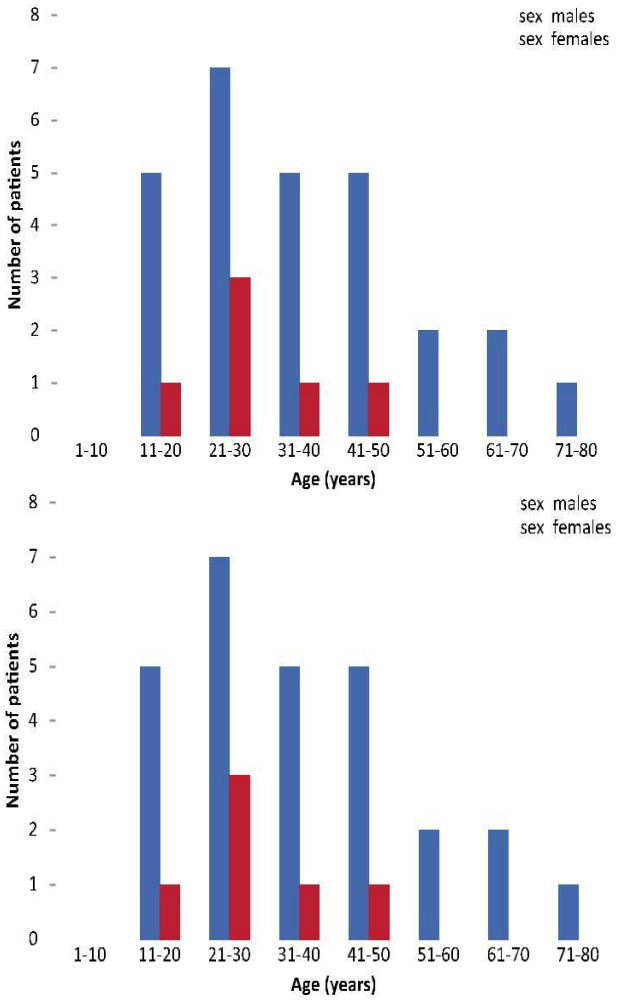
Relevant data was statistically analyzed using SPSS software version 15.

RESULTS

Thirty-three patients who presented in our surgical unit as cases of perforation peritonitis and who eventually turned out to be cases of small bowel perforation in a period of 1 year were included in this prospective study. 54 (81.8%) of the patients were males and 12 (18.2%) were females withages ranging from 10 to 80 years. The peak age incidence was from 21 to 30 years [Figure 1]. All the patients came from a rural background.

Abdominal pain and distension was the commonest presenting symptom in all 66 (100%) patients. 24 (36.3%) patients were in shock [Table 1]. Duration of illness varied from 1 to 5 days. All 6 (9%) trauma patients presented early, within 1 day of injury while the rest 60 (91%) presented at variable time intervals up to 5 days.

34 (51.5%) patients had evidence of pneumoperitoneum on erect plain X-ray chest and abdomen. 46 (69.6%) were diagnosed with the same on abdominal ultrasound examination. CECT abdomen was carried out in 4 (6%) patients of trauma to exclude associated injuries. 10 (15.1%) patients had bilateral pleural effusions and 4 (6%) were HBsAg positive. 40 (60.6%) had leukocytosis. Hyponatremia, hypokalemia were the commonest electrolyte imbalances seen in 14 (21.2%) patients. 10 (15.1%) also had raised serum creatinine levels. All patients underwent an exploratory laparotomy within 10 h (range 3-10) of presenting in the emergency room. The peritoneal cavity had bile or faecal soiling in all patients. 46 (70%) patients were of duodenal perforation, 6 (9%) of jejunal whereas 14 (21%) had a single ileal perforation. Nonsteroidal anti-inflammatory drugs (NSAIDs)/peptic ulcer disease (PUD) were responsible for duodenal perforation in 42 cases, 4 cases were of trauma. A Cellan-Jones omental patch repair was done for all these cases of duodenal perforation. Idiopathic inflammation, tuberculosis and malignancy accounted for the jejunal perforations. Resection anastomosis for malignancy and primary closure for the other 4 cases was carried out. Five cases of ileal perforation due to typhoid fever required ileostomy, primary closure for trauma and primary resection anastomosis for tubercular perforation with associated distal stricture were the other procedures done. Surgical site infection, and wound dehiscence requiring secondary suturing was the commonest postoperative complication seen in 10 (15.1%) patients. (3%) patient developed an incisional hernia which was repaired after 6 months [Table 2]. The total hospital stay ranged from 5 to 40 days, with a mean of 22 days. There were two mortalities, one each due to traumatic duodenal perforation and typhoid ileal perforation.



DISCUSSION

Small bowel perforation is one of the commonest surgical emergencies in the developing nations especially in the rural areas. We here report 66 cases of the same which give an insight to the challenges they pose in management in poor resource areas like ours.

Most of the perforations occurred in the age group 21-30 years with a male preponderance. Various studies have

reported a mean age of 43.4 ± 14.4 years for duodenal perforations[1] and 36.3 years for typhoid ileal perforations with abdominal pain and distension as the commonest clinical presentations[2] the same which was in all our patients. Indiscriminate use of NSAID and steroids in villages accounted for the high incidence of duodenal perforation (63.6%) in our series which is in sharp contrast to the decreasing trends of −29.9% in the western literature.[3] Typhoid ileal perforations were next on the list responsible for 10 (15.1%) cases and tended to occur within the 1st week of illness as reported in other third world countries with poor basic sanitation and drinking water facilities.[4] Pneumoperitoneum on plain erect chest and abdominal X-rays was diagnostic of perforation in 51.5% cases similar to that reported by Singh *et al*.[5] Ultrasonography of the abdomen which is highly operator dependant was diagnostic in 60.6% cases as opposed to a 97% positive predictive value reported by Chen SC *et al*.[6] In our emergency most ultrasound studies are carried out by the emergency duty residents accounting for the missed cases.

All patients underwent exploratory laparotomy within 10 h of presenting in the emergency room after a period of rehydration to achieve a urinary output of 0.5 ml/kg/h and correction of electrolyte imbalance which probably resulted in a high survival rate.[7]

Cellan-Jones omental patch for duodenal perforations due to NSAID/PUD was the preferred procedure for it could be accomplished in a very short time. Duodenorrhaphy was performed in only two blunt injury abdomen perforations resulting from blows delivered by wild animals. Both of these perforations were in the anterior wall of the second part of the duodenum.[8] Jejunal perforations were treated as per etiology. Primary closure for nonspecific inflammation and tuberculosis and segmental resection anastomosis for the rare adenocarcinoma.[9] All five typhoid perforations were treated by exteriorizing the single distal ileal perforations as a loop ileostomy which was considered much safer than performing a primary closure in the background of faecal peritoneal contamination. Ileostomy does increase morbidity but saved 4 (80%) of these moribund patients. A large series of 60 patients from Larkana, Pakistan has compared primary closure, exteriorization of perforation and resection anastomosis as the primary modality of treatment in cases of typhoid ileal perforations and inferred that provision of primary or covering stoma related directly to improved survivals.[10] One case of trauma where a dilatation and curettage resulted in perforation of the uterine fundus and adjoining ileum was repaired primarily. Tubercular perforation preceding a stricture was dealt by segmental resection anastomosis [Figure 3]. Surgical site infection in up to 55.5% cases and mortality of 23.1% has been reported from one series in Tanzania of typhoid ileal perforations.[11] We however, could save 4 (80%) of our patients with typhoid perforation by exteriorizing the perforated bowel as an ileostomy. These data are however, not comparable due to our small sample size.

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