ACUTE ABDOMEN IN THE ELDERLY- INCIDENCE, AETIOLOGY, CLINICAL PATTERN AND TREATMENT OUTCOME

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ABSTRACT

BACKGROUND

Acute abdomen is the commonest cause of admission in surgical emergencies even in the present era where trauma cases have increased manifold. It is also a common occurrence in the elderly patients. Most authors define patients older than 60 years as elderly and the associated geriatric emergency cases have posed significant diagnostic and management challenges, in part due to patients' tendency to delay seeking medical care, atypical presentations, presence of coexisting diseases, atypical physical examination findings, atypical laboratory values and higher morbidity and mortality.

MATERIALS AND METHODS

The prospective observational clinical study was conducted on 113 patients aged above 60 years attending Regional Institute of Medical Sciences (RIMS) outpatient department and emergency services with acute abdomen and admitted in the Department of Surgery, RIMS, Imphal, Manipur, from October 2013 to September 2015. Study was done through questionnaires and clinical examination, biochemical investigations including renal function tests, liver function tests and serum electrolytes. X-ray erect abdomen, C T scan abdomen, upper GI endoscopy, X-ray Barium studies and Colonoscopy were performed if required on case to case basis. Laparotomy and histopathological examination was done wherever necessary/possible and data was analysed using SPSS version 16.

RESULTS

The mean age of presentation was 67.25 years, ranging from 60 to 92 years of age. Males comprised 53.1% and females were 46.9%. Around 66.7% of acute abdomen patients presented within 48 hours and 93.9% of them presented within 5 days. Generalised tenderness was present in 23.5% of patients and 30.9% of patients had pain restricted to a single region. Acute cholecystitis (28.3%) was the commonest condition followed by acute appendicitis (19.4%), acute intestinal obstruction (16.8%), malignancy (13.8%) and perforation peritonitis (8.1%).

CONCLUSION

The mean age of presentation was 67.25 years and no statistically significant differences in age and sex distribution. Ultrasound screening of whole abdomen is the most useful investigation in the rest. Surgical operation should be anticipated in patients with anorexia, pyrexia, shock, dehydration, rebound tenderness, guarding, obliteration of liver dullness, leukocytosis, urinary abnormalities.

KEYWORDS

Acute abdomen, elderly, Pathological conditions, Rebound tenderness.

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BACKGROUND

The birth of human life probably started with pain and this acute abdominal pain has haunted mankind ever since the pre-historical era. The earliest record however dates back to the ancient Greek civilization, which acquired knowledge from the Mesopotamia via Asia Minor and also from Egypt as well. By 6th century BC medical schools started flourishing on the island of Cos and the adjacent peninsula of Cridos (the modern-day Turkey). The most famous medical teacher of Cos was the man who is commonly regarded as the `Father of Medicine`, Hippocrates (? 460-543 BC).[1] He was born on Cos, was the son of a physician. His writings, a compilation of his experience and probably also the teachings of his contemporaries often express contradictory views. The eight important titles include Fractures, Aphorisms, Prognostics, Ulcers, Surgery, Fistula and Haemorrhoids.[1]

The Hippocratic writings were characterized by being factual, they contain descriptions of careful observations of the actual patients, they resist elaborate theories of disease

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and emphasize the power to heal, encouraged by suitable diet, rest and exercises. In severe cases, further aid was given by blood letting, purging or sweating and occasionally radical surgical intervention. Here goes description of such an observation in the chapter nine of `The Epidemics, `The women who lodged at the house of Tisamenas had a troublesome attack of iliac passion (acute abdominal pain and distension), much of vomiting; could not keep her drink; pain about hypochondria; and pains also in lower part of the belly; not thirsty; became hot; extremities cold throughout with nausea and insomnolence; urine scanty and thin; dejections undigested, thin, scanty. Nothing could do her good. She died`-Hippocrates (as quoted by Harold E).

This description is similar to the classical pain of appendicitis which migrated down, then ruptured with peritonitis and death. Perhaps, the best known of his clinical descriptions is that of patient dying of infections which is still known as Hippocratic Facies, `Nose sharp, eyes hollow, temples sunk, ears cold and contracted and their lobes bulging out, the skin about the face dry, tense and parched, the colour of the face as a whole being yellow or black, vivid or lead coloured`.

It is only within the last two hundred years that we have had more or less accurate knowledge of the intra-abdominal diseases that cause the acute abdominal pain. The main reason for this comparatively late development of medical knowledge was that, the only method of obtaining accurate information was post-mortem examination of the intra-abdominal organs. It was either forbidden or disliked by the medical authorities. Moreover, surgical operations upon the abdomen were not performed commonly until the beginning of the 19th century.[2] Sir Henle remarked that in any acute abdominal emergency, the greatest sacrifice is the sacrifice of time.[3]

Abdominal pain is a common occurrence in the elderly patients and poses a difficult challenge for the clinician. Since the mean age of the population is increasing, acute abdominal pain in the elderly is becoming more significant and important for the clinician. The definition of "elderly" varies among different studies, but most authors define patients older than 60 years as elderly.

Previous studies demonstrated that among the elderly patients presenting to the emergency department with abdominal pain, at least 50% were hospitalized and 30–40% eventually had surgery for the underlying condition.[4, 5] Some authors reported that approximately 40% of the elderly patients with acute abdomen were misdiagnosed, contributing to an overall mortality of approximately 10%.[6]

An accurate history is more difficult to obtain in older patients for several reasons, including fear of loss of independence, dementia, cerebrovascular disease, depression, decreased auditory function, language barriers, and decreased mentation from a variety of other causes including the use of medications such as opiates and benzodiazepines, fever, electrolyte abnormalities, and alcohol.

Jones JS et al[7] showed that elderly patients were less likely to receive analgesics for long-bone fractures than younger patients, which might reflect a relative inability of elderly patients to perceive or express pain compared with their younger counterparts.

Although arguably the most important symptom in any patient presenting with an abdominal surgical emergency is that of pain, elderly patients might not complain of pain at all, and they might have complaints that are seemingly unrelated to the underlying pathology. Cooper GS[8] found that the elderly are four times more likely to be hypothermic in response to an abdominal process. Parker JS[9] found that the average White Blood Cell (WBC) count in elderly patients who have a surgical abdomen was only 12, 400 cells/mm^3. These factors cause the diagnostic accuracy to be lower and mortality far higher in the elderly than in the younger patients.

Previous studies have shown that a considerable volume of diagnostic errors would be reduced by paying more attention to diagnosis before laparotomy. We aimed to study prospectively the clinical pattern of acute abdomen in the elderly in our institute, Regional Institute of Medical Sciences, Imphal.

MATERIALS AND METHODS

This is a prospective observational study conducted in the Department of Surgery, Regional Institute of Medical Sciences (RIMS), Imphal, Manipur, from October 2013 to September 2015 on all the patients aged more than 60 years admitted in the surgical wards of RIMS, Imphal with the diagnosis of acute abdomen. According to the appropriate statistical formula the sample size was calculated to be 113 as $n = Z^2 P (100-P) / L^2$ where n is sample size.

P is the anticipated prevalence.

D is the desired precision (D = 8).

Z is the appropriate value from the normal distribution for the desired confidence (Z is 1.96 for a precision level of 95% and 5% allowable error.

P is 75 (Proportion of individuals with free air under the diaphragm who died in a study by Catherine AM et al).[10]

$n = 1.96^2 * 75(100-75) / 8^2$

$n = 112.546875$

$n = 113$

Approval of the Institutional Ethics committee, Regional Institute of Medical Sciences, Imphal was obtained and confidentiality was maintained. There was no conflict of interest.

Variables recorded were age, sex, pain, anorexia, nausea, vomiting, bowel motions, co-morbidities, body temperature, pulse rate, blood pressure, respiratory rate, hydration, tenderness, guarding, liver dullness, leukocyte count, x-ray findings, ultrasonographic findings, mode of management, outcome, and hospital stay.

At the end of the study data collected from the study were tabulated and analysed accordingly. The observation of the study was recorded in data base programme IBM SPSS version 16.

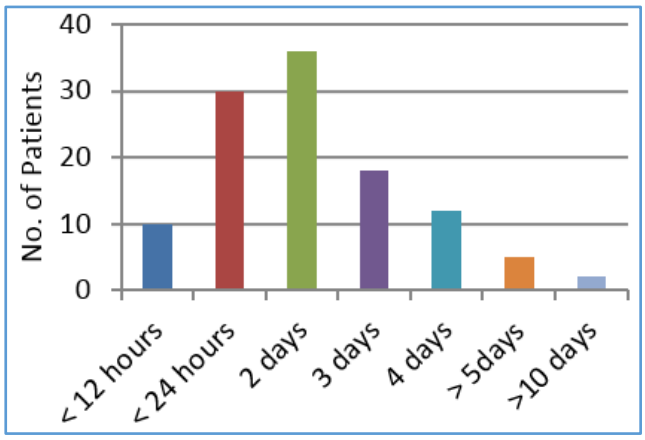
RESULTS

The mean age of presentation was 67.25 years, ranging from 60 to 92 years of age. Patients in the age group of less than 80 years were 77.87% (88 patients). Males comprised 53.1% of the study sample and females were 46.9%.

Around 66.7% patients presented with pain abdomen within 48 hours and 93.9% of them presented within 5 days. Anorexia was present in 62% of patients. Twenty two percent of the patients had no nausea or vomiting whereas 46% had one or more episodes of nausea or vomiting. Normal bowel motions were observed in 52.4% patients, whereas diarrhoea or constipation was present in the rest. A total of 72 patients (63.8%) had one or more associated disease: 21 had cardiovascular disease including 7 with myocardial infarction, 15 had chronic pulmonary disease, 9 had neurological pathologies, 13 had chronic renal failure (4 patients in dialytic treatment), 12 personal history of other malignancies, one inflammatory bowel disease, 2 rheumatoid arthritis, 1 Child Class C cirrhosis. Around one third of the patients (32.7%) presenting with acute abdomen were not febrile at presentation. Only 44% of patients had a pulse rate of more than 90/min and only 12.3% of the patients in the study presented with shock. Around 18% of the patients presented with tachypnoea of >30/min. 35% presented with severe dehydration. Generalised tenderness was present in 23.5% of patients and 30.9% of patients had pain restricted to a single region. Rebound tenderness was present in only 16.8% of patients. Localized guarding was present in 32.7% of patients. Liver dullness was obliterated only in 15.1% of the patients. Leukocytosis was present in 24.7% of the patients. X-ray erect abdomen was done routinely in the study with nearly 78% of the patients it showed no specific findings, 16.8% showed free gas under diaphragm, 3.5% showed ground glass appearance and 4.6% had more than 3 air-fluid levels. Ultrasound abdomen was diagnostic in 47.7% of the patients. 65(57.5%) were managed operatively and 48(42.5%) non-operatively. Acute cholecystitis (28.3%) was the most common condition in elderly patients presenting with acute abdomen in the present study followed by acute appendicitis (19.4%) and acute intestinal obstruction (16.8%). Acute intestinal obstruction comprised 16.8% of acute abdomen with adhesive small bowel obstruction (47.3%) being the most common aetiology. Overall mortality was 9 patients (10.17%) out of 113, and the most common etiology of mortality being acute intestinal obstruction (3.39%) followed by malignancy (2.26%).

Age Parameters	Statistics
Number of patients	113
Range	32
Minimum	60
Maximum	92
Mean	67.25 years

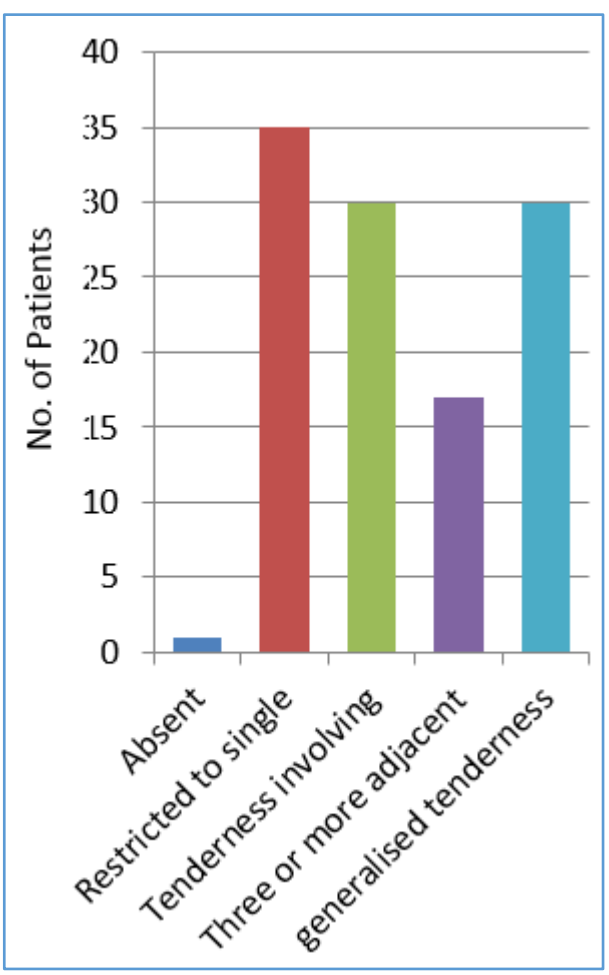
Table 1. Age Distribution of Patients Presenting with Acute Abdomen



Graph 1. Pain Abdomen

Pain Duration	No. of Patients	Percentage
< 12 hours	10	8.4 %
< 24 hours	30	26.5 %
2 days	36	31.8 %
3 days	18	15.9 %
4 days	12	10.6 %
> 5 days	5	4.4 %
> 10 days	2	1.7%
Total	113	100.0%

Table 2. Duration of Pain at Presentation



Graph 2. Tenderness by Regions

	No. of Patients	Percentage
Absent	1	1.1%
Restricted to Single Region	35	30.9%
Tenderness Involving Two Adjacent Regions	30	23.5%
Three or More Adjacent Regions	17	15.0%
Generalised Tenderness	30	23.5%
Total	**113**	**100%**

Table 3. Region-Wise Distribution of Tenderness

Aetiology	Frequency	Percentage
Acute cholecystitis	28	24.9%
Acute appendicitis	24	21.3%
Acute intestinal obstruction	21	18.6%
Perforation peritonitis	11	9.8%
Acute pancreatitis	9	7.9%
Acute gastritis	7	6.3%
Colitis	3	2.6%
Urinary Tract Infection	3	2.6%
Mesenteric lymphadenitis	3	2.6%
Typhoid ileitis	2	1.7%
Cystitis	2	1.7%
Total	**113**	**100%**

Table 4. Diagnosis After Clinical Examination

Aetiology	Frequency	Percentage
Acute intestinal obstruction	18	27.7%
Acute appendicitis	17	26.1%
Perforation Peritonitis	8	12.3%
Malignancy	8	12.3%
Acute Cholecystitis	7	10.8%
Others	7	10.8%
Total	65	100%

Table 5. Operative Management

Final Diagnosis*	**Clinical Diagnosis** ***Correct*** No. of Patients/ (Percentage)
Acute Cholecystitis	28 (87.5%)
Acute Appendicitis	22 (91.6%)
Acute Intestinal Obstruction	19 (90.4%)
Malignancy	13 (86.7%)
Perforation Peritonitis	9 (81.8%)
Acute Pancreatitis	4 (80%)
Non Specific Abdominal Pain	2 (66.7%)
Others	1 (50%)
Total	**98 (86.7%)**

Table 6. Accuracy of Clinical Diagnosis Compared to Final Diagnosis

*Final diagnosis – Diagnosis after confirmation by investigation/operation.

DISCUSSION

Males constituted 53.1% (60 patients) compared to females 46.9% (53 patients). The sex seems to be evenly distributed overall. This is similar to many other studies wherein males account for most of the admissions for acute abdomen in the elderly. However, in a similar cohort females were more in a study by Laurell H.[2]

A total of 72 patients (63.8%) had one or more associated disease: 21 had cardiovascular disease including 7 with myocardial infarction, 14 had chronic pulmonary disease, 9 had neurological pathologies, 11 had chronic renal failure (4 patients in dialytic treatment), 15 personal history of other malignancies, one inflammatory bowel disease, 2 rheumatoid arthritis, one Child Class C cirrhosis, which is almost similar in the study conducted by Costamagna D, et al.[11]

Acute cholecystitis was seen in 32 patients (28.3%) and it was the most common disease in the elderly, followed by acute appendicitis which is seen in 22 patients (19.4%) in the present study. This is in agreement with the studies of the Bugliosi TF et al[4] where in biliary tract diseases and small bowel obstruction were the two most common specific diagnoses. Acute Appendicitis was seen in 22 patients (19.4%) and it was the second most common diagnosis in the present study. Similar was the finding in the study by Wig JD et al[12] 22.4%. It is the most common cause of acute surgical condition of the abdomen in elderly.[13]

Acute intestinal obstruction was seen in 19 patients (16.8%), with half of them expectedly having adhesive small bowel obstruction (47.3%) as the cause, following previous abdominal surgery. Acute intestinal obstruction was the commonest cause of acute abdomen in the study by Costamagna Det al[11] and Bugliosi TF et al.[4]

The most common aetiology of obstruction was obstructed inguinal hernia and malignancy in these studies. There is a change in the trend of intestinal obstruction due to popularization of elective hernia repairs. These observations are consistent with the findings in the present study. Volvulus constituted 2.2% of all acute abdominal cases in a study by Laal M, et al[14] in contrast to 5.2% in the present study.

Generalised peritonitis/perforation peritonitis was seen in 9 patients (8.1%) and it was the fifth most common diagnosis in this study. It was the second most common in a study by Wig JD et al while it was the third most common diagnosis of Sankaran V, et al[15] which was done in general population.

Acute pancreatitis was seen in 6 patients (5.3%). Wani M, et al[3] reported an incidence of 5% of patients of acute abdomen in general population having acute pancreatitis. Muhammad A, et al[16] have made an interesting remark that all the patients labelled as Non-specific abdominal pain (NSAP) does not mean that there was no cause. It only means that one's skills in making a diagnosis needs to be improved and new diagnostic tools should be used wherever necessary to improve the diagnosis. Some authors have incriminated socio-economic factors and diet to be responsible for the observed differences.

The delay in seeking early medical care is attributed by the Staniland JR, et al[17] to the attitude of majority of patients giving a trial of observation at home, but poor roads, poor connectivity, ignorance among people at this place are also additional factors. Anorexia was present in 62% of patients and nausea or vomiting was present in 73.1% in patients presenting with acute abdomen in elderly which is in close conformity to Wig JD et al.[18] Fever suggests an association of inflammatory process with acute abdomen in elderly. There was no fever in 32.7% of patients with acute abdomen. A similar observation was made by Raghavendra HS[19] with 60% of their patients operated of acute abdomen had fever. Jhobta RS et al[20] reported tachypnoea in more than 66% of their perforation peritonitis patients. The initial differential diagnosis can be determined by a delineation of pain location, radiation and movement. However only 38% of patients had pain localised to specific site as observed by Staniland JR et al.[17] Moll van Charante EP et al[21] have recently concluded that digital rectal examination (DRE) does not have added diagnostic value for appendicitis, peritonitis or small bowel obstruction. Assarian A et al[22] found that abdominal X-rays were deemed unnecessary in 53% of patients. Many studies support abandoning the routine use of abdominal x-rays in patients with acute abdomen.

Our study acknowledges the facts by De Dombal FT et al,[23] Muhammad A et al[16] and Laal M, et al[14] that the typical findings seem to occur in only about 60-70% of patients which help in correct diagnosis, 30-40% of cases may be misdiagnosed at presentation following these observations regarding the natural history.

CONCLUSION

Among the elderly patients, acute abdominal pain constituted the majority of our emergency surgical admissions. One-fifth of them suffered from non-surgical causes mimicking acute abdomen. Acute cholecystitis (28.3%) was the commonest condition causing acute abdomen in elderly followed by acute appendicitis (19.4%), acute intestinal obstruction (16.8%), malignancy (13.8%) and perforation peritonitis (8.1%).

The mean age of presentation was 67.25 years. There were no statistically significant differences in age and sex distribution. Majority of our patients present within 4 days of pain. Pain duration is not significantly associated with any pathology. Anorexia, nausea or vomiting was present in nearly half of the patients. A third of patients are febrile and more than three-fourths of patients are dehydrated at presentation. Nearly 12% of elderly patients with acute abdomen present with shock, 18% of patients have respiratory rate of >30/minute. Only 35% of patients have pain localized to a specific site. Guarding is present in nearly 55.8% of patients with about one-fourth having generalized gaurding. Liver dullness obliteration is seen in 68% of patients of perforation peritonitis. Digital rectal examination is normal in majority of patients with no added diagnostic utility.

Leukocytosis and urinary abnormalities are non-specific and seen in only 24.7% and 33% of acute abdomens respectively. X-ray is the most useful investigation in cases of suspected perforation and obstruction. Ultrasound screening of whole abdomen is the most useful investigation in the rest. Only 57.5% patients need surgical management irrespective of age, sex, duration of pain, presence of nausea or vomiting. The mean hospital stay is around 9 days. It does not differ significantly with age or sex but the operated patients stay significantly longer. Mortality rate was 7.9% a total of 9 patients, with most common disease suffering, being acute intestinal obstruction.

Clinical diagnosis is accurate in 86.7%. Majority of misdiagnosis are in pancreatitis pathology. The presence of anorexia, pyrexia, shock, dehydration, rebound tenderness, guarding, obliteration of liver dullness, leukocytosis, urinary abnormalities at presentation are the significant factors predicting the need for surgery. Diagnostic accuracy and pattern of acute abdomen in the elderly in this study are comparable with most of the literature reviewed. While common aetiologies should never be overlooked, rare things should also be kept in mind and special investigations should be used judiciously to further improve the diagnostic accuracy. Indiscriminate use of blanket investigations should be avoided. Surgical operation should be anticipated in patients having the said predictive factors.

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