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Comparative Study of Intraoperative and CT Findings in Acute Abdomen

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INTRODUCTION

Dental Abdominal pain is one of the most common reasons for visits to the emergency room. Although for the majority of patients, symptoms are benign and self-limited, a subset will be diagnosed with an "acute abdomen. Acute abdominal pain is a surgical emergency requiring admission to hospital. An expeditious workup is necessary when evaluating patients presenting with acute abdominal pain to determine the most likely cause of their symptoms and determine whether or not emergent operative intervention is necessary. The workup includes a thorough history and physical examination followed by the judicious use of laboratory and radiologic studies. The evaluation of patients with acute abdominal pain can pose a diagnostic challenge for physicians as patients may present with atypical symptoms that interfere with the usual pattern recognition that often guides decision making. These atypical presentations may help account for the over 25% of abdominal pain cases labeled as "nonspecific" or "undifferentiated". A correct diagnosis may emerge over time, but delays may result in inappropriate management, affecting both morbidity and mortality. Inaccurate diagnosis may lengthen hospital stay, a major contributor to the costs of health care.

Diagnostic work-up with imaging can consist of plain X-ray, ultrasonography (US), computed tomography (CT) and even diagnostic laparoscopy. CT can diagnose a wide range of acute abdominal conditions, such as acute appendicitis, diverticulitis, renal tract calculi, pancreatitis and small bowel obstruction. CT is often used as the 1st line investigation. There are currently no set guidelines for prioritizing imaging of acutely presenting surgical patients and a decision is often based on the clinical judgment only. In most cases a rationale for an urgent CT is clear, however in patients presenting sub-acutely a decision can be difficult and CT delayed. Various small studies boast of greater diagnostic sensitivity (90%) compared with clinical evaluation alone (75%) but no randomised controlled trials have assessed its use as a diagnostic aid for acute abdominal pain. The widespread use of CT has led to concerns about exposing patients to ionizing radiation as abdominal CT exposes a patient to an effective radiation dose of approximately 10 mSv. Thus the increased use of CT for the evaluation of abdominal pain needs to be reassessed. We aimed to determine if computed tomography in patients with acute abdominal pain improves the accuracy of diagnosis.

PARTICIPANTS AND METHODS

Our study was undertaken at PGIMS, Rohtak. All patients with acute abdominal pain presenting to Accident and emergency Department from October 2015 to March 2016 were eligible for entry into our study. Patients were excluded if they were under 16 years of age, pregnant or were diagnosed with non surgical cause of acute abdomen.

PROTOCOL FOR COMPUTED TOMOGRAPHY

Patients presenting to Surgery Casualty room of Accident and emergency department, PGIMS, Rohtak with the complaint of pain abdomen were assessed clinically. In the patients suspected to have acute abdomen based on history and clinical examination, routine investigations such as complete haemogram, blood biochemistry, Xray abdomen and Chest and ultrasound abdomen were done to rule out the medical causes of acute abdomen, form a working diagnosis to guide further management of the patient and assess the need for surgical intervention. The patients in whom clinical diagnosis was in doubt, CECT abdomen was done. For the purposes of this study all the patients of acute abdomen due to surgical cause, who were haemodynamically stable and did not require urgent laparotomy on presentation, were subjected to CECT abdomen. Patients were given oral contrast medium (20 ml meglumine diatrizoate (Gastrografin; in 1000 ml water) 2 hours before CT and intravenous contrast medium (100 ml iopamidol 300 mg/ml) just before taking the scan. Helical computed

tomograms were obtained from the diaphragm to the symphysis pubis, with a 10 mm collimation, 1.5 pitch, and 10 mm reconstruction interval. Computed tomography was reported by the on-call radiologist, who had scope to obtain additional images if necessary.

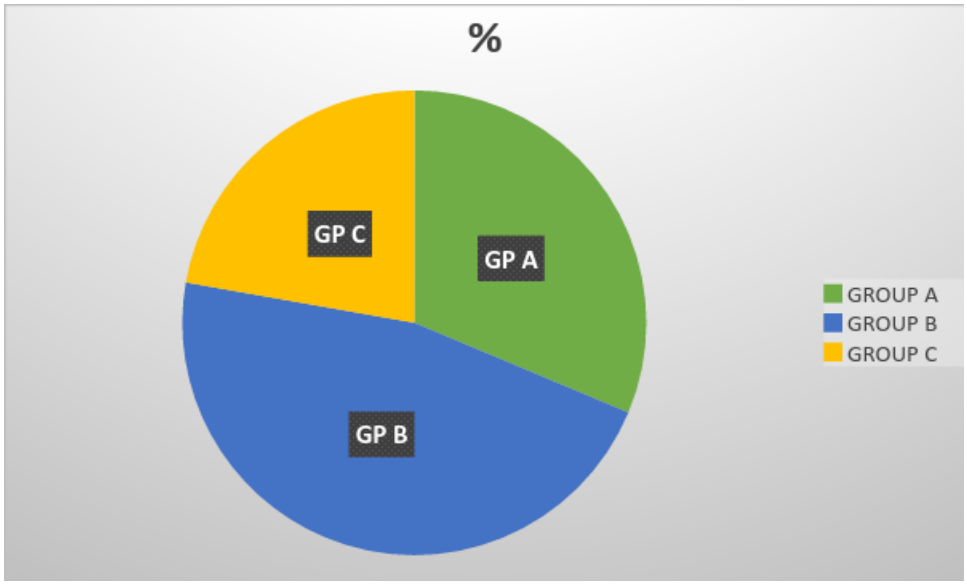
RESULTS

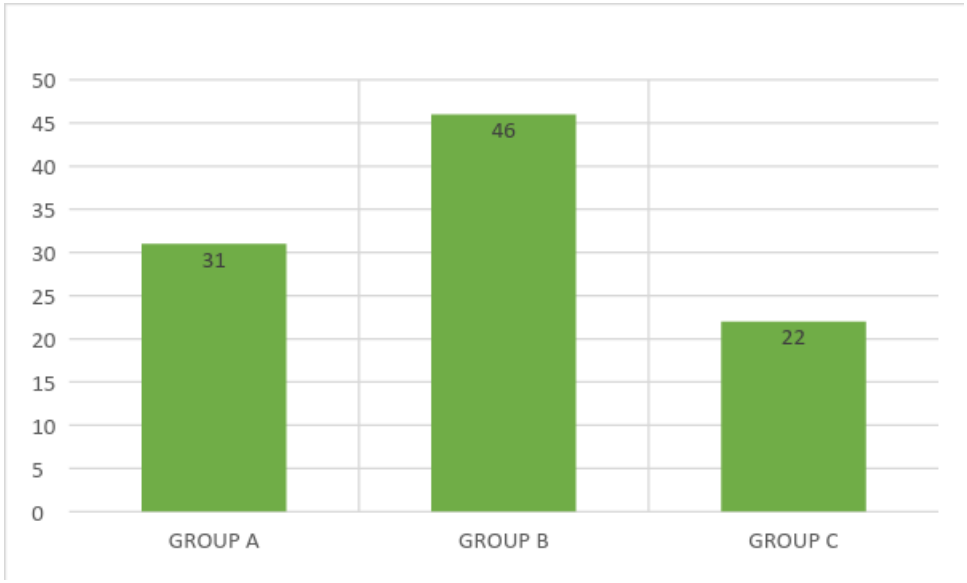
Overall, 1500 patients of acute abdomen reported to Surgery casualty room, Accident and emergency department, PGIMS, Rohtak, from October 2015 till March 2016. Out of these 241 patients underwent CECT abdomen. Out of these 241 patients, 97 patients underwent surgery. The intraoperative findings of these 97 patients were recorded and compared with the CECT findings. The patients were classified into 3 groups based on the comparison of the intraoperative and CECT findings :

Group A - CT findings matched intraoperative findings - 30 cases (30.927%)

Group B - CT was inconclusive and no diagnosis established - 46 (47.42%)

Group C - CT missed the actual pathology causing acute abdomen - 21 (21.64%)





DISCUSSION

The term acute abdomen refers to a clinical syndrome characterized by sudden onset of severe abdominal pain requiring emergency medical or surgical treatment. Prompt and accurate diagnosis is essential if morbidity and mortality are to be significantly decreased. The differential diagnosis includes an enormous spectrum of disorders ranging from benign self limited conditions to conditions requiring emergency surgery. Clinical assessment is often difficult, and laboratory and conventional radiologic findings are often nonspecific. The use of CT for the evaluation of abdominal pain has increased significantly in recent years.

The development of cross-sectional imaging has had a tremendous impact on the diagnosis and treatment of acute abdomen. This is not only because of introduction of newer and improved technologies that are more sensitive in diagnosis but also because of widespread availability of these machines nowadays. With the widespread use of CT comes concerns about exposing patients to ionizing radiation. Abdominal CT exposes a patient to an effective radiation dose of approximately 10 mSv. In the interest of decreasing radiation exposure, efforts have been made to use CT more judiciously while maintaining acceptable diagnostic sensitivity and specificity.5 The use of low-dose CT for evaluating suspected appendicitis is another strategy to decrease radiation exposure. Various prospective studies boast of diagnostic accuracy of nearly 95% in acute abdomen and is useful not only in diagnosing the primary abnormality but also in detecting and characterizing the full extent of disease. According to these studies, CT is the imaging modality of choice for patient triage, and many hospitals now have helical CT scanners on-site in the emergency department. However, such grandiose results have not been reciprocated everywhere, including our Institution.

There were 62 men and 25 women with mean age of 61.65 (20-92) years. All patients presented with abdominal pain in combination with other symptoms. 91.5% of the patients had positive abdominal findings of tenderness (90.1%), distension (12.8%) and 15 (10.6%) patients had documented fever. CT scan had significant, some and no influence on management decisions. The CT scan's influence on the management decisions included change of diagnosis, supporting the need for surgery, prompting referral to other specialty, avoiding surgical intervention. Conditions that can be accurately diagnosed by CT scan include acute appendicitis, acute cholecystitis, perforated peptic ulcer, acute pancreatitis, small bowel obstruction. However these are the conditions which frequently present with signs and symptoms that prompt the clinical diagnosis and abdominal examination that warrants surgical exploration. Such were the patients in Group A of our study, in which CT findings matched intraoperative findings. It comprised of 30 cases out of 97 cases (30.927%). However, CT is most often indicated in patients with severe abdominal pain who present with confusing or conflicting clinical signs and symptoms. Out of the 97 patients, 57 patients had intraoperative findings that did not corroborate with the CT findings (58.76%)- either the exact pathology could not be found or the CT findings were too non specific to establish a diagnosis to further guide the management. Among 57 such patients, CT missed the actual pathology causing acute abdomen in 21 patients (21.64%- Group C) and CT findings were inconclusive and no diagnosis could be established in 46 patients (47.42% - Group B). Conditions missed or incorrectly diagnosed by CT included mesenteric ischaemia, diverticulitis, inflammatory bowel disease, traumatic bowel perforations.

CONCLUSION

The subjective nature of pain, its complex neuroanatomic pathways, and the fact that a common symptom can arise from a broad spectrum of diseases combine to make acute abdomen difficult to diagnose. Nevertheless, two important decisions must be made: does the patient need surgery? and if so, how soon? Immediate surgery is required for patients with massive hemorrhage (e.g., abdominal aortic aneurysm rupture); other conditions (e.g., perforation and intestinal ischemia) require surgical intervention in a few hours because additional delay increases morbidity. A delay of more than 12 hr is detrimental in disorders such as appendicitis, mesenteric venous thrombosis, and strangulated small-bowel obstruction. CT has become an important noninvasive imaging tool to diagnose acute abdomen and but it does not answer all the questions posed above. So the role of CT scan in acute abdomen still remains limited.

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