ISSN 2515-8260 Volume 08, Issue 03, 2021

Evaluation of efficacy of computed tomography in diagnosis of acute abdomen

Naresh Kumar[1], Rajesh K Badhan[2]

[1, 2]Assistant Professor, Department of Radio Diagnosis, Rajindra Hospital, Patiala, Punjab, India

Corresponding author: Naresh Kumar,Assistant Professor, Department of Radio Diagnosis, Rajindra Hospital, Patiala, Punjab, India. Email ID: drnaresh525@gmail.com

Abstract

Background: Acute abdominal pain is among the three most common symptoms in patients coming to emergency departments or being admitted to hospitals. Computed tomography is more sensitive and accurate at detecting abnormalities than plain radiography because of its cross sectional nature. Hence; the present study was undertaken for evaluating efficacy of computed tomography in diagnosis of acute abdomen. Materials & methods: The present study was conducted with the target of analysing the effectiveness of computed tomography in diagnosis of acute abdomen. Continuous monitoring of the hemodynamic vitals was done during the contrast injection procedure. Evaluation of 20 subjects was done who were referred to our Department with clinical presentation of acute abdomen were enrolled. US of the abdomen were done in all the patients. Clinical and demographic details of all the patients were obtained. A predesigned Performa was made for compiling the radio-imaging findings. The statistical analysis of the data was done using SPSS version 11.0 for windows. Results: Sensitivity and specificity of CT in diagnosing Mesenteric ischemia, Gut malrotation, gut perforation and gall bladder perforation was 100 percent each. In diagnosing appendicitis, sensitivity and specificity was 90 percent each while in diagnosing pyelonephritis, sensitivity and specificity was 80 percent and 90 percent respectively. Conclusion: For establishing the diagnoses of acute abdominal pain patients, MDCT is an effective imaging modality.

Key words: Acute abdominal pain, CT

INTRODUCTION

Acute abdominal pain is among the three most common symptoms in patients coming to emergency departments or being admitted to hospitals. Acute abdomen is defined as a syndrome induced by a variety of pathologic conditions that require emergent medical or, more often, surgical management. Specific or strongly suggestive physical and laboratory data are used to diagnose the underlying condition. Imaging studies are often requested because an acute abdomen may be caused by a variety of diseases that have very similar clinical features. No consistent and reliable relationship exists between the presences, severity, extent and cause of an acute abdominal process and its external or systemic manifestations. From a clinical point of view, it is important to distinguish conditions requiring immediate surgical intervention from those that can be managed nonsurgically. In many cases, surgery may not be necessary or may be contraindicated.[1- 3]

Computed tomography is more sensitive and accurate at detecting abnormalities than plain radiography because of its cross sectional nature. The superiority of computed tomography in detecting free intraperitoneal gas is a good example. The disadvantages of computed tomography include availability of resources and radiation dose. Computed tomography should therefore be used with caution in acute abdominal pain; it is probably best reserved for patients with pain of unknown cause. Computed tomography is not infallible and clinical evaluation and review remain crucial.[4- 7] Hence; the present study was undertaken for evaluating efficacy of computed tomography in diagnosis of acute abdomen.

MATERIALS & METHODS

The present study was conducted with the target ofanalysing effectiveness of computed tomography in diagnosis of acute abdomen. Ultrasound procedures were performed with Philips Envisor or GE Logiq α200 with a 3.5 mhz sector or curvilinear probes. Computed tomography procedures were performed with Siemens-Somatom Emotion 6 slice third generation spiral Computed tomography. Continuous monitoring of the hemodynamic vitals was done during the contrast injection procedure. Evaluation of 20 subjects was done who were referred to our Department with clinical presentation of acute abdomen were enrolled. US of the abdomen were done in all the patients. Clinical and demographic details of all the patients were obtained. A predesigned Performa was made for compiling the radio-imaging findings. The statistical analysis of the data was done using SPSS version 11.0 for windows.

RESULTS

Sensitivity and specificity of CT in diagnosing Mesenteric ischemia, Gut malrotation, gut perforation and gall bladder perforation was 100 percent each. In diagnosing appendicitis, sensitivity and specificity was 90 percent each while in diagnosing pyelonephritis, sensitivity and specificity was 80 percent and 90 percent respectively.

Table 1: Specificity and sensitivity of CT in diagnosing acute abdomen

Final diagnosis	Sensitivity	Specificity
Mesenteric ischemia	100	100
Gut malrotation	100	100
Gut perforation	100	100
Appendicitis	90	90
Gallbladder perforation	100	100
Pyelonephritis	80	90

DISCUSSION

The term “acute abdomen” defines a clinical syndrome characterised by the sudden onset of severe abdominal pain requiring emergency medical or surgical treatment. In an analysis of more than 10,000 patients presenting with acute abdominal pain the aetiology could not be determined in one-third of these cases. Of those patients in whom a diagnosis was made, 28% had appendicitis, 9.7% acute cholecystitis, 4.1% small bowel obstruction, 4% acute gynaecological disease, 2.9% acute pancreatitis, 2.9% acute renal colic, 2.5% perforated

peptic ulcer, and 1.5% acute diverticulitis. Various potentially lifethreatening processes can cause acute abdominal pain, thus a rapid and accurate diagnosis is essential to reduce morbidity and mortality.[7- 10] Hence; the present study was undertaken for evaluating efficacy of computed tomography in diagnosis of acute abdomen

In the present study, Sensitivity and specificity of CT in diagnosing Mesenteric ischemia, Gut malrotation, gut perforation and gall bladder perforation was 100 percent each. B Siewertet al evaluated the effect of CT on the diagnosis and management of acute abdominal pain in patients who did not undergo surgery and to determine what population of patients would profit most from CT examination. Clinical data and CT reports of 91 patients with acute abdomen (41 men and 50 women, 22-96 years old) were analysed retrospectively. The accuracies of clinical evaluation and CT in revealing the cause of acute abdomen were compared, and the effect of CT on patient management was assessed. Analysis included the entire population of patients and these subgroups: (1) patients who had symptoms for fewer than 24 hr versus patients who had symptoms for 24 hr or more and (2) patients who had a history of abdominal diseases versus patients who had no such history. Twenty-nine patients had signs or symptoms for fewer than 24 hr, and 62 patients had signs or symptoms for 24 hr or more. Fifty-nine patients had a history of abdominal disease, and 32 had no history of abdominal disease. In the entire population of patients, CT was superior to clinical evaluation for diagnosing the cause of acute abdomen (sensitivity was 90% for CT and 76% for clinical evaluation, $p < .0005$). Management was changed after CT in 25 patients ($p < .0005$). Similar differences were observed in the subgroups of patients with signs and symptoms for fewer than 24 hr, patients with signs and symptoms for 24 hr or more, and patients with no history of abdominal disease ($p < .05$). In the subgroup of patients with a history of abdominal disease, the differences between clinical evaluation and CT were not statistically significant. CT is an excellent examination technique for patients with acute abdomen, regardless of the duration of signs and symptoms.[10]

In the present study, in diagnosing appendicitis, sensitivity and specificity was 90 percent each while in diagnosing pyelonephritis, sensitivity and specificity was 80 percent and 90 percent respectively. Ng CS et al evaluated the impact of early abdominopelvic computed tomography in patients with acute abdominal pain of unknown cause on length of hospital stay and accuracy of diagnosis. 120 patients admitted with acute abdominal pain for which no immediate surgical intervention or computed tomography was indicated. 55 participants were prospectively randomised to early computed tomography (within 24 hours of admission) and 65 to standard practice (radiological investigations as indicated). Length of hospital stay, accuracy of diagnosis, and, owing to a possible effect on inpatient mortality, deaths during the study were assessed Early computed tomography reduced the length of hospital stay by 1.1 days (geometric mean 5.3 days (range 1 to 31) v 6.4 days (1 to 60)), but the difference was non-significant (95% confidence interval, 8% shorter stay to 56% longer stay, P=0.17). Early computed tomography missed significantly fewer serious diagnoses. Seven inpatients in the standard practice arm died. Only 50% (59 of 118) of diagnoses on admission were correct at follow up at 6 months, but this improved to 76% (90) of diagnoses after 24 hours. Early abdominopelvic computed tomography for acute abdominal pain may reduce mortality

and length of hospital stay. It can also identify unforeseen conditions and potentially serious complications.[11]

CONCLUSION

For establishing the diagnoses of acute abdominal pain patients, MDCT is an effective imaging modality.

REFERENCES

1. Rosen MP, Sands DZ, Longmaid HE, III, Reynolds KF, Wagner M, Raptopoulos V. Impact of abdominal CT on the management of patients presenting to the emergency department with acute abdominal pain. Am J Roentgenol. 2000;174:1391–1396.
2. Stapakis JC, Thickman D. Diagnosis of pneumoperitoneum: abdominal CT vs upright chest film. J Comput Assist Tomogr. 1992;16:713–716.
3. Jeffrey RB Jr, GrendelliF!,Federle MR et al. Improved survival with early CT diagnosis of pan- creatic abscess. Gastmintest Radio! 1987:12:26-30
4. Schneekloth G, Terrier F, Fuchs WA. Computed tomography of intraperitoneal abscesses. Gastrointest Radio! 1982:7:35-41
5. Fishman EK, Kavuru M, Jones B, et al. Pseudomembranous colitis: CT evaluation of 26 cases. Radio!ogy 1991:180:57-60
6. Puylaert JBCM, van der Zant FM, Rijke AM. Sonography and the acute abdomen. Am J Roentgenol. 1997;168:179–186.
7. Mindelzun RE, Jeffrey RB. Unenhanced helical CT for evaluating acute abdominal pain: a little more cost, a lot more information. Radiology. 1997;205:43–47.
8. Birnbaum BA, Jeffrey RB., Jr CT and sonographic evaluation of acute right lower quadrant abdominal pain. Am J Roentgenol. 1998;170:361–371.
9. Rao PM, Rhea JT, Novelline RA, Mostafavi AA, Lawrason JN, McCabe CJ. Helical CT combined with contrast material administered only through the colon for imaging of suspected appendicitis. Am J Roentgenol. 1997;169:1275–1280.
10. B Siewert 1, V Raptopoulos, M F Mueller, M P Rosen, M Steer. Impact of CT on diagnosis and management of acute abdomen in patients initially treated without surgery. AJR Am J Roentgenol. 1997 Jan;168(1):173-8
11. Ng CS, Watson CJ, Palmer CR, et al. Evaluation of early abdominopelvic computed tomography in patients with acute abdominal pain of unknown cause: prospective randomised study. BMJ. 2002;325(7377):1387.