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COMPARISON OF CLINICAL JUDGMENT AND RADIOLOGICAL CORRELATION IN EVALUATION OF ACUTE ABDOMEN

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ABSTRACT: BACKGROUND: The aim of the study is to assess the accuracy of clinical examination in acute abdomen with radiological imaging. **DESIGN:** Retrospective trail. **INTRODUCTION:** Acute abdominal pain may be caused by a variety of conditions ranging from benign self-limiting disease to surgical emergencies. Accurate diagnoses of acute abdominal pain require detailed patient history, thorough physical examination, laboratory tests and diagnostic imaging. Taking into consideration the various causes of acute abdomen, a definitive diagnosis is often difficult with physical examination alone. Diagnostic imaging has become extremely important for accurate diagnosis of acute abdomen. This study has been done to assess the accuracy of clinical examination in acute abdomen with radiological imaging. **MATERIALS AND METHODOLOGY:** Clinical data and radiology (CT/ USG) reports of 500 patients with acute abdomen were analyzed retrospectively from March to July 2014. The provisional diagnoses available were renal colic, appendicitis, biliary colic and pancreatitis. The accuracy of clinical evaluation was assessed by comparing the clinical diagnosis with CT/USG findings in each of these conditions. Cumulative accuracy percentage was obtained, along with accuracy percentage for each of these conditions. **RESULTS:** Out of 500 cases, renal colic was the most commonly encountered diagnosis (64%). Positive percentage of accurate diagnosis is 79% in pancreatitis, 54 % in renal colic, 48 % in biliary colic and 45 % in appendicitis respectively. The overall accuracy of clinical diagnosis with respect to the final radiological diagnosis was 55%. **CONCLUSION:** In general, patients presenting with acute abdomen should undergo a meticulous physical examination with appropriate radiological investigations in order to establish an accurate diagnosis and also to initiate therapeutic interventions necessary for reducing the morbidity in these patients.

KEYWORDS: Diagnostic accuracy, renal colic, biliary colic, appendicitis, pancreatitis Ultrasonography, computed tomography.

INTRODUCTION: Abdominal pain is one of the most common reasons for a visit to the casualty. Majority of the conditions pose a diagnostic challenge, as the causes for the pain are usually unclear. Rapid and accurate detection of emergency conditions is vital for managing the patients. Accurate diagnosis in modern day practice is often reached by substantiating clinical diagnosis with laboratory investigation and radio imaging.

Over decades imaging modalities have aided clinicians in making an accurate diagnosis.

X-ray, Ultrasonography and computed tomography are the most commonly used imaging modalities for diagnosis of acute abdomen. USG is widely available, affordable & has no risk of radiation. CT has in depth resolution imaging capabilities, but has a risk of ionizing radiation. Based on the probable diagnosis the physicians have a choice between the various imaging modalities available.

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The most common conditions encountered in our hospital were renal colic, appendicitis, biliary colic and pancreatitis. So this study was conducted to assess the accuracy of clinical diagnosis in acute abdomen with radiological imaging in our hospital.

MATERIALS AND METHODS: In this retrospective study we collected data of 500 patients from the period of March to July 2014 at Chettinad Health City and Research Institute. Patients of all age group with available provisional diagnosis of renal colic, acute appendicitis, biliary colic and pancreatitis were included in the study. Patients with inconclusive clinical diagnosis and other causes of acute abdomen were excluded in the study, as there was a lack of sufficient amount of cases for diagnosing the clinical accuracy. Clinical data and radiology (Computed tomography / Ultrasonography) reports of these selected patients were analyzed.

All these patients were subjected to ultrasound and in case of inconclusive ultrasound diagnosis, computed tomography was done. The experience of Ultrasonography and CT readers ranged from 5 to 10 years experience as a radiologist. The study was performed in an Ingenuity core 128 slice PHILIPS CT, Voluson 730 expert USG, Philips Acuzon and GE Logic Pro 5. The accuracy of clinical evaluation with CT/USG reports in each of these conditions was derived. Cumulative accuracy percentage of diagnostic accuracy was obtained, along with accuracy percentage for each condition by statistical analysis using T-Test statistical hypothesis using SPSS (Version.21) software package.

RESULTS: Of the 500 cases of acute abdomen, renal colic was the most commonly encountered diagnosis accounting for 64% of the cases followed by appendicitis 16%, biliary colic 14 % and pancreatitis 6%.

THE PIE CHART REPRESENTS THE PERCENTAGE DISTRIBUTION OF PROBABLE DIAGNOSIS.

Fig. 1

Out of 322 patients with definite clinical diagnosis of renal colic, 183 cases (54%) were detected to have positive results. The remaining 139 patients were radiologically diagnosed to have liver pathologies 4% (6 cases), cholelithiasis / cholecystitis 3.6% (5cases), uterine and ovarian pathologies 2.9% (4 cases), appendicitis 1.4% (2 cases), pancreatic pathology 0.7% (1 case) and normal study in the remaining patients 87% (121 cases).

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Appendicitis is the second most commonly encountered provisional diagnosis in our study. Out of 80 patients with provisional diagnosis of acute appendicitis, 36 cases were detected positive (45%). The other cases were diagnosed hemorrhagic ovarian cyst 7% (3 cases), mesenteric lymphadenitis 18% (8 cases), renal pathologies 39% (17 cases) and colitis 4% (2 cases) and normal study 34% (15 cases).

In 70 cases with provisional diagnosis of biliary colic in which there is female predominance in the age group of 51 to 70 years of age. Of these 70 cases only 34 cases (48%) were diagnosed to have positive results. The other cases were diagnosed as pancreatitis 3% (1 case), sigmoid diverticulitis 3% (1 case), mesenteric lymphadenitis 3% (1 case), renal colic 14% (5 cases) and normal study 78% (28 cases).

In total of 28 cases pancreatitis 22 cases where diagnosed precisely. The accuracy of a clinician to diagnose pancreatitis is highest with 79%. The negative cases were diagnosed to have renal colic 67% (4 cases), appendicitis 17% (1 case) and colitis 17% (1 case). CT was confirmative in most of the cases.

Conditions	Sig.(2 - tailed)	Mean difference
Renal colic	.001344	.567
Appendicitis	.00241	.438
Biliary colic	.00194	.486
Pancreatitis	.000423	.786

Table 1

The Table 1 denotes a significant mean difference by 2 – tailed test with respect to the ability of radiological modalities to diagnose the respective clinical conditions.

Fig. 2

Comparative graph depicts the probable diagnosis and the definitive diagnosis. It shows that pancreatitis has the highest predictive value.

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The clinical diagnosis was compared with final Ultrasound and CT diagnosis in each of these conditions. The overall accuracy of clinical diagnosis with respect to the final radiological diagnosis was 55%. The positive accuracy percentage for diagnosing pancreatitis was 79 %, 54 % in renal colic, 48 % in biliary colic and 45 % in appendicitis.

DISCUSSION: In our study the accuracy of clinical diagnosis was variable for varying clinical conditions. The overall positive predictive accuracy was 55% with highest accuracy (78%) for pancreatitis.

The commonly used imaging modalities in a setting of acute abdomen are Plain radiograph, USG and CT. Plain films are commonly used in a clinical scenario pertaining to bowel obstruction and perforated viscera, but the lack of sensitivity and specificity as compared to other modalities like CT has limited their use to a great extent.

Wytze lameris et al 2009⁽¹⁾ have concluded despite the fact that CT has evolved and proven beyond doubt to be superior to ultrasound in certain clinical scenarios, USG is still preferred as the initial imaging modality of choice due to its wide spread availability, low cost and non-invasiveness.

Ashley hardy et al 2013⁽²⁾ in their study has reported that MR imaging plays a key role in conditions such as acute appendicitis in pregnancy, ectopic pregnancy. MRI provides excellent visualization of the intra-abdominal organs without the need for ionizing radiation, its cost, time factor & lack of universal availability makes them less useful in evaluation of acute abdomen.

Clinical evaluation plays a key role in diagnosing patients with acute abdomen, radiological modalities form a strong support in confirming the clinical diagnosis.

In our hospital setting renal colic accounted for the most common cause of acute abdomen in patients presenting to emergency trauma care. As mentioned by Oner. S et al 2004,⁽³⁾ the accuracy rates for detecting renal calculi on USG was 60% whereas on CT detection rates corresponded to 100 %. So diagnosing renal calculi promptly with appropriate imaging modalities helps formulate treatment strategies.

Acute appendicitis is a critical condition with a lethal outcome that requires immediate diagnosis. USG is the initial modality of choice but the accurate detection rates are markedly reduced due to bowel gas. The accuracy rates for diagnosing acute appendicitis on USG and CT are 83% and 94% respectively as mentioned by Andrea S. D et al 2006.⁽⁴⁾ The use of CT in cases of suspected acute appendicitis has greatly increased over the past several years and has markedly reduced the number of negative appendectomy from 24% to 3 %.⁽²⁾

The role of imaging modalities in diagnosing biliary colic is well established. Imaging modalities not only aid in diagnosis of biliary colic but also guide interventional strategies. The accuracy rates for detecting acute cholecystitis and cholelithiasis on USG was 92% vs. 100% on CT according to Stuart E. Mirvi et al.⁽⁵⁾

Acute pancreatitis can present with a wide clinical spectrum ranging from mild to severe forms. Treatment of patients with acute pancreatitis is based on the initial assessment of disease severity which relies on the CT severity index. Adrienne v R et al described the accuracy rates for detecting acute pancreatitis on USG as 99% while CT percentages corresponded to 100%,⁽⁶⁾ Hence CT can be used as the imaging modality of choice in diagnosing pancreatitis.

Thus prompt diagnosis of acute abdomen with radiological modalities, not only aid in decision making but can significantly reduce patient morbidity and mortality.

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CONCLUSION: Evaluating acute abdomen poses a diagnostic challenge given the limited access to resources. Therefore the role of imaging in a setting of acute abdomen is of prime importance not only in establishing a diagnosis, but also in initiating therapeutic interventions that aid the patient's prognosis. Hence the study proves the importance of radiological imaging modalities and a good clinico-radiological correlation in a setting of an acute abdomen and in clinical scenarios where an appropriate clinical diagnosis cannot be arrived.

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