ORIGINAL ARTICLE

CT Findings in Adult Patients Presenting with Non- Traumatic Acute Abdomen

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ABSTRACT

Objective: To determine the frequency of different radiological findings on CT scan in patients presenting with acute abdomen pain for accurate interventions.

Study Design: A Descriptive Cross-Sectional study.

Place and Duration of Study: The study was conducted in the department of Radiology Northwest General Hospital Peshawar, from 24th November 2018, to 24th April, 2019.

Materials and Methods: The study encompassed 197 patients referred from the outpatient department, regardless of gender, aged 15 years or older, and experiencing severe abdominal pain within a 48-hour period. Complete information, including patient age, gender, and symptom duration, was meticulously documented, along with CT findings essential for precise interventions. These details were recorded on a pre-designed proforma. The CT scans were conducted using either a 16-slice Toshiba machine or a 16-slice GE machine.

Results: As per frequencies and percentages for CT Findings between ages 15 years to 60 years, 142 (72.08%) patients were recorded with cholecystitis, 37 (18.78%) patients were recorded with diverticulitis and 18 (9.13%) patients were diagnosed with acute appendicitis.

Conclusion: In this study we concluded that cholecystitis is the leading cause of acute non-traumatic abdominal pain followed by diverticulitis and acute appendicitis. The preferred method for diagnosing acute abdominal pain is CT, which will have a significant impact on how individuals with acute abdominal pain are treated in a substantial manner & urgent management of patients in our local population.

Key Words: *Appendicitis, Diverticulitis, Cholecystitis, Tomography Spiral Computed, Diagnostic Imaging.*

Introduction

Acute abdomen is a medical emergency in which the correct diagnosis can be delayed or prevented by various factors, with subsequent adverse patient outcomes. It is crucial to take abdominal pain seriously since it frequently indicates a severe underlying condition and the potential for misdiagnosis.[1,2,3.]

The use of imaging techniques such as plain radiography, ultrasonography, CT scans, and magnetic resonance imaging (MRI) has become progressively more crucial in evaluating patients with acute abdomen. Plain abdominal X-rays and erect chest X-rays serve as valuable initial screening methods, but their results often lack specificity.[8] Ultrasonography, on the other hand, offers a cost-effective and radiation-free approach without the need for contrast agents. However, its accuracy may be compromised in obese individuals or those with limited mobility, and it can cause discomfort in patients with highly sensitive abdominal areas.[1]

Computed tomography plays a major role in reaching the diagnosis regardless of the nonspecific clinical presentations[5], which may be vague, ranging from self-limiting to serious life-threatening conditions. Evaluating a patient's pain involves considering various factors, including positional, palliating, and provoking elements, as well as the quality of pain, its location, radiation, referral patterns, severity, and temporal aspects such as the time and mode of onset, progression, and any previous episodes.[2] CT scan is the preferred imaging modality for diagnosing acute abdominal pain[8,9], as it significantly impacts the treatment approach for patients experiencing

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this condition.

Studies have been conducted on other modalities in our local population; however, there is a scarcity of research focusing on CT scans for individuals experiencing non-traumatic acute abdominal pain. Given the precision of CT scan in diagnosing the pathology, there arose a need for a study to comprehensively record these findings. This documentation would contribute to efficient management and reduced hospitalization duration.

This study aims to ascertain the prevalence of CT findings in individuals with acute abdominal pain, with the goal of enabling precise interventions, thereby facilitating timely diagnoses. Understanding the frequency of various radiological findings in cases of non-traumatic acute abdominal pain would significantly impact the treatment and management of patients within our local population.

Materials and Methods

This cross-sectional descriptive study was conducted from 24th November, 2018 to 24th April, 2019, at Radiology Department of Northwest General Hospital Peshawar as per the ethical approval received from the Institutional Review Board and Ethical Committee of the hospital vide their letter reference number IRB&EC/2018-GH/0111 dated 01 Nov 2018. The study was conducted with total sample size of 197 keeping proportion. Confidence interval being 95% absolute precision was required 4% using WHO calculator. The sampling technique used was non-probability consecutive sampling technique. The inclusion criteria were that patient of any gender, greater than or equal to 15 years of age, presenting with severe abdominal pain (> 4 VAS Pain Score) within 48 hours was included in the study. Exclusion criteria was previously operated cases and patients with known disease process. All the patients referred from the outpatient department of Northwest General Hospital Peshawar or any referral from outside fulfilling the inclusion and exclusion criteria was taken.

An informed consent was taken from all the patients included in the study, the nature of procedure, any risks, time consumed, data review and publication were explained completely to the patients. CT scan was performed using either 16 slice Toshiba or 16 slice GE machine. All the above information including age, duration of symptoms, and CT findings for accurate interventions was recorded.

Computation and analysis of the data was performed by using SPSS version 23. Frequencies and percentages were calculated for categorical variables like CT findings and gender. Mean and Standard deviation was calculated for numerical variables like age, weight, BMI and duration of symptoms. CT findings were stratified among age, gender, diabetes mellitus, hypertension, weight, BMI, and duration of symptoms. The technique of post stratification was implemented using the chi-square test to assess statistical significance, with a threshold set at a P value equal to or less than 0.05.

Results

The study encompassed a cohort of 197 participants, who were enrolled from the Diagnostic Radiology department. Descriptive statistical analysis revealed that the average age was recorded as 45 years with a standard deviation of 11.94. Additionally, the mean duration of symptoms was found to be 35 hours, accompanied by a standard deviation of 8.13.

Regarding the distribution of age groups, the study observed that 29 patients (14.72%) fell within the 15-30 years age category, 73 patients (37.05%) were categorized in the 31-45 years age group, and 95 patients (48.22%) were classified within the 46-60 years age range. (Table No II).

As per frequencies and percentages for CT Findings, 142 (72.08%) patients were recorded with cholecystitis, 37 (18.78%) patients were recorded with diverticulitis and 18 (9.13%) patients were diagnosed with acute appendicitis. (Table No. I). Stratification of CT findings with respect to age, duration of symptoms, are shown in Table No. II to III.

Table I :Frequency and Percentages for CT Findings (n=197)

CT Findings	Frequencies	Percentages
Acute Appendicitis	18	09.13%
Diverticulitis	37	18.78%
Cholecystitis	142	72.08%
Total	**197**	**100%**

Discussion

In our study, cholecystitis was identified in 142 patients (72.08%), while diverticulitis was documented in 37 patients (18.78%). Additionally, 18 patients (9.13%) received a diagnosis of acute

Table II: Stratification of CT Findings with Age (n=197)

Age	Age Group Frequencies	CT Findings Positive	Frequencies	Percentages	P Value
15-30 Years	29 (14.72%)	Acute Appendicitis	4	2.03%	0.000035
		Diverticulitis	6	3.00%	
		Cholecystitis	19	9.64%	
31-45 Years	73 (37.05%)	Acute Appendicitis	7	3.55%	0.00001
		Diverticulitis	13	6.59%	
		Cholecystitis	53	26.90%	
46-60 Years	95 (48.22%)	Acute Appendicitis	7	3.55%	0.00001
		Diverticulitis	18	9.10%	
		Cholecystitis	70	35.53%	

Table III: Stratification of CT Findings with duration of Symptoms (n=197)

Duration of Symptoms	CT Findings Positive	Frequencies	Percentages	P Value
≤ 30 Hours	Acute Appendicitis	08	4.06%	0.00001
	Diverticulitis	16	11.67%	
	Cholecystitis	55	27.91%	
> 30 Hours	Acute Appendicitis	10	5.07%	0.00001
	Diverticulitis	21	10.65%	
	Cholecystitis	63	31.97%	

appendicitis. When scrutinizing age distribution, our study showcased a predominant inclusion of patients within the age bracket of 15-60 years, constituting the highest count at 95 individuals (48.22%).

In a study carried out by Shamim in Pakistan, the leading reason for hospital admissions requiring surgical intervention was found to be diseases related to the digestive system, with a prevalence rate of 29.1%. This was followed by urinary tract diseases, accounting for 21.4% of cases. Among the specific causes of acute abdominal admission in this series, acute urinary tract infection (UTI) was the most common at 9.4%, followed by nonspecific abdominal pain at 7.2%. Acute appendicitis accounted for 4.8% of cases, acute retention for 2.4%, acute intestinal obstruction for 2%, ileal perforation for 0.6%, and duodenal perforation for 0.4%.[7]

The CT findings in elderly patients presenting to ER in a study conducted by Gardner CS showed that the occurrence rates of different conditions were as follows: S0mall Bowel Obstruction (SBO) accounted for 18%, Diverticulitis for 9%, Non-ischemic vascular-related emergencies for 6%, bowel ischemia for 4%, appendicitis for 3%, and colonic obstruction for 2%. CT scan findings had an impact on treatment strategies, with 65% of cases leading to treatment adjustments, 48% involving surgical interventions, and 52% involving medical interventions.[4]

Unlike the findings observed in the studies, which highlighted urinary tract infections (UTIs) and small bowel obstructions as the prevalent issues, our investigation demonstrates a distinct trend. Cholecystitis emerges as the dominant concern within our local population, reflecting its prominent prevalence attributed to specific causative factors. This significantly will aid in the effective treatment and immediate management of patients within our local community.

Limitation of Study

Ultrasound is generally used as the diagnostic tool of choice[8,17,18]. The sample in this study excluded those patients who were diagnosed using ultrasound and pregnant patients, as CT is contraindicated in pregnant patients.[13,19] Due to its high cost, extended scan periods, and restricted availability, Magnetic Resonance Imaging (MRI) has traditionally had a relatively limited role in the assessment of appendicitis. However, the absence of ionizing radiation makes it a desirable modality for patients who are pregnant.[20] In fact, Gatta et al. shows that when evaluating pregnant women, MRI is far better to transabdominal ultrasonography.[15] Additionally, it appears that MRI for appendicitis has similar sensitivity and specificity to computed tomography (CT) scanning.[14] However, using MRI were out of scope of this study.

In comparison to other modalities, CT findings in acute abdominal pain are more accurate with more sensitivity and specificity to diagnose the pathology.[21,22] It is suggested to extend the study to diagnose the pathology according to the precise location of pain in relation to the quadrants. This would help to specify the pathology and make accurate differentials in our local population.

Conclusion

In this study we concluded that cholecystitis is the leading cause of acute non-traumatic abdominal pain followed by diverticulitis and acute appendicitis. This help in a substantial manner in treatment & urgent management of patients in our

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local population. We have also concluded that patients presenting with acute nontraumatic abdominal pain can be evaluated with abdominal CT. The preferred method for diagnosing acute abdominal pain is CT, which will have a significant impact on how individuals with acute abdominal pain are treated and managed in our population.

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CONFLICT OF INTEREST

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DATA SHARING STATMENT

The data that support the findings of this study are available from the corresponding author upon request.

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