



CODEN [USA]: IAJ PBB

ISSN: 2349-7750

## INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

<http://doi.org/10.5281/zenodo.3251949>

Available online at: <http://www.iajps.com>

Research Article

### ANALYSIS OF DIAGNOSTIC ACCURACY OF COMPUTED TOMOGRAPHY FOR ACUTE APPENDICITIS PATIENTS

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Article Received: April 2019

Accepted: May 2019

Published: June 2019

**Abstract:**

**Introduction:** Appendix is a small pouch attached to the beginning of large intestine. Appendicitis, an inflammation of the appendix, is the most common acute surgical condition of the abdomen. Almost 10% of the general population develops acute appendicitis with maximal incidence in the second and third decades of life. **Objective:** To determine diagnostic accuracy of computed tomography in the diagnosis of acute appendicitis patients.

**Materials and Methods:** This study was conducted in the Jinnah Hospital, Lahore in November 2017 till April 2018. Through a Descriptive Cross-Sectional Study Design, a total of 191 patients suspected of having acute appendicitis were included in the study in a consecutive manner and subjected to CT pre-operatively and histopathology post operatively for the acute appendicitis.

**Results:** The mean age of the patients was 29.5 + 6.7 years. We had 53.4% males & 46.6% females. On CT we observed that the acute appendicitis was recorded in 58.1% of patients compared to 47.6% on histopathology. On applying the formulae for calculation, sensitivity of CT was found to be 89% and specificity 70%. The positive predictive value of the CT is 72.9% and negative predictive value is 87.5%.

**Conclusion:** It is concluded that CT is a highly sensitive and specific tool for the detection of acute appendicitis. As such, it is a useful radiological marker for diagnosis of acute appendicitis in adults and further studies are recommended to confirm its usefulness.

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Please cite this article in press Maria Naseer et al., *Analysis Of Diagnostic Accuracy Of Computed Tomography For Acute Appendicitis Patients.*, Indo Am. J. P. Sci, 2019; 06[06].

**INTRODUCTION:**

Appendix is a small pouch attached to the beginning of large intestine. Appendicitis, an inflammation of the appendix, is the most common acute surgical condition of the abdomen. Almost 10% of the general population develops acute appendicitis with maximal incidence in the second and third decades of life. Surgical removal of such inflamed appendix is the most commonly performed emergency operation in the world and has long been considered the standard procedure of treatment of appendicitis [1]. Its peak incidence is between the ages of 10 and 30 years.5 Differential diagnosis of appendicitis is often a clinical challenge because appendicitis can mimic several abdominal conditions [2].

Traditionally, acute appendicitis has always been a clinical diagnosis based on patient history, physical examination, and laboratory testing. A high percentage of negative appendectomies (20%) was considered reasonable, based on the premise that delay would inevitably lead to perforated appendicitis and thus increased morbidity and even mortality [3]. This classical practice is currently being abandoned by most surgeons, as negative appendectomies are no longer considered acceptable. They carry a substantial morbidity, increase hospital costs and may be avoided by using preoperative radiological imaging or diagnostic laparoscopy [4].

The diagnostic modalities, however, that are considered to be the most accurate for making the diagnosis appendicitis, such as CT and laparoscopy, also have negative repercussions. Computed tomography exposes the patient to considerable ionizing radiation, and laparoscopy is an invasive procedure performed under general anesthesia and thus carries a risk of morbidity [5]. Thus, use of imaging modalities such as ultrasonography (US) and computerized tomography (CT) has helped to decrease the rates of perforation, morbidity and mortality, in addition to shortening the length of hospital stay [6].

**OBJECTIVES:**

To determine diagnostic accuracy of computed tomography in the diagnosis of acute appendicitis patients.

**MATERIALS AND METHODS:**

This Cross-sectional study was conducted in Jinnah Hospital, Lahore in November 2017 till April 2018. The Sample size was 191 using the following parameters. The data was collected through non-probability consecutive sampling.

**DATA COLLECTION:**

The study was conducted after approval from hospitals ethical and research committee. All patients presenting to OPD with high suspicion of acute appendicitis was included in the study. The purpose and benefits of the study was explained to the patient, they was assured upon the purpose and benefits of the study, the risks involved and they was explained that the study is done purely for research and data publication and if agreed upon a written informed consent was obtained from the parents of the neonate.

**STATISTICAL ANALYSIS:**

The collected data was entered in SPSS version 20 and analyse through it, study variable was CT findings and Histopathology report. Frequency and percentage were calculated for categorical variables like gender. Mean  $\pm$  SD was calculated for continuous variables like age.

**RESULTS:**

The study was conducted on 191 patients suspected of having acute appendicitis. The mean age of the sample was  $29.5 \pm 6.7$  years. The range of age in our study was 23 years with minimum age of 19 years and maximum age of 42 years. On grouping the sample in different age groups, we observed that 26.2% of patients were in the age group up to 25.00 years, 47.1% were in the age group 25.01 to 35.00 years and 26.7% of patients were in the age group 35.01 to 45.00 years.

**Table 1: AGE-WISE DISTRIBUTION OF SAMPLE**

	<b>n</b>	<b>Range</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Age of the patient	191	23.00	19.00	42.00	29.5136	6.73198
<b>Age Groups</b>				<b>Frequency</b>	<b>Percent</b>	
Up to 25.00 years				50	26.2	
25.01 to 35.00 years				90	47.1	
35.01 to 45.00 years				51	26.7	
Total				191	100.0	

**DISCUSSION:**

The clinical appreciation of a patient with suspected appendicitis remains challenging as it is complicated by nonsurgical diseases that mimic appendicitis. The accuracy of the clinical diagnosis is approximately 80%, which corresponds to a negative appendectomy rate of around 20%. This flaw in diagnostic accuracy has traditionally been accepted as it was considered most important to perform an early operation [7]. Quality assurance focused on perforated appendicitis rather than negative appendectomy rates. This practice has become less accepted for several reasons: the morbidity and costs associated with a negative appendectomy are substantial, and there is ample evidence that preoperative imaging can reduce the negative appendectomy rate, and lessen the use of hospital resources [8]. Even though some institutions have reported contradictory results, preoperative imaging for all patients with suspected appendicitis is gaining support. Another reason for abandoning indiscriminate explorations for suspected appendicitis is new insights into the natural history of appendicitis. These challenge the belief that the perforated appendicitis rate is inversely related to the negative appendectomy rate and thus avoidable by urgent appendectomy [9]. Perforated appendicitis rates are not influenced by in-hospital delay and have not decreased with the increasing use of CT imaging [10].

**CONCLUSION:**

It is concluded that CT is a highly sensitive and specific tool for the detection of acute appendicitis. As such, it is a useful radiological marker for diagnosis of acute appendicitis in adults and further studies are recommended to confirm its usefulness.

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