ROLE OF TOTAL LEUKOCYTE COUNT IN DIAGNOSIS OF ACUTE APPENDICITIS

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Background: Acute appendicitis is a common surgical emergency. Diagnosis may be difficult with little help from radiological and laboratory investigations. Total leukocyte count is one of the helpful investigations, being evaluated in this study. **Methods:** The patients presenting with right lower quadrant abdominal pain whom were diagnosed as having acute appendicitis and later underwent appendicectomy were included in the study. The preoperative leukocyte count was compared with histo-pathology findings of removed appendix. Sensitivity and specificity of TLC was calculated by standard formulas. **Results:** The sensitivity and specificity of TLC as calculated in this study is 76.5% and 73.7% respectively while positive predictive value is 92.5%. **Conclusion:** TLC although not a diagnostic criteria for acute appendicitis but still is helpful investigation in decision making.

Keywords: Total Leukocyte count (TLC), Acute appendicitis

INTERODUCTION

Acute Appendicitis is the most frequent cause of persistent and progressive abdominal pain for all ages[1], accounting for 10% of all abdominal surgeries[2] and one third of all paediatrics hospital admissions with acute abdominal pain.[3]

The accurate diagnosis of acute right iliac fossa pain remains a difficult clinical problem as the differential diagnosis of such a pain is not straight forward.[4] In spite of development of various diagnostic scores[5] and diagnostic aids like C-reactive proteins[6], the diagnosis has been confusing for the clinician[4] as no laboratory or radiological test is 100% accurate.[7]

Total Leukocyte count (TLC) is one of the helpful investigations in diagnosis of acute appendicitis. Mild leukocytosis, ranging from 10,000 to 18,000 is usually present in patients with acute, uncomplicated appendicitis and is often accompanied by a moderate polymorphonuclear predominance.[8]

TLC is easily available test and not very expensive. It can be done in almost all laboratories round the clock. Various studies have been published on the evaluation of role of Leukocytosis in the diagnosis of acute appendicitis. The diagnostic accuracy of TLC is increased further if combined with CRP, neutrophil count, shift to the left, sequential leukocyte count and neutrophil **:** lymphocyte ratio.[9,10]

The main objective of this study was to calculate the sensitivity and specificity of leukocytosis in the diagnosis of acute appendicitis.

PATIENTS AND METHODS

This descriptive study was conducted in the department of General Surgery, Ayub Teaching Hospital Abbottabad over a period of six months from March to August 2007. Patients more than twelve year of age with either sex, admitted with right iliac fossa pain (i.e., symptoms and signs suggestive of acute appendicitis), whom were diagnosed as having acute appendicitis on clinical grounds and later underwent appendicectomy, were included in study. Patients not willing to participate, age less than twelve year, those with signs and symptoms of genitourinary disease, generalized peritonitis and appendicular mass were excluded of the study. Pre-operative blood samples were collected and submitted to laboratory of Ayub Teaching Hospital for leukocyte count. Leukocyte count more than 10×10^9/L was taken as cut off value. Post-operatively appendicectomy specimens were submitted to laboratory of Ayub Medical College for histo-pathology while significant infiltration of mucosal and muscular layer with polymorphonuclear neutrophils, epithelial ulceration and presence of crept abscesses were taken as microscopic evidence of acute appendicitis.

RESULTS

Of the 100 patients included in study, 58 (58%) were male while 42 (42%) were female patients, making a male to female ratio of 1.38**:**1. Age range was 12 to 59 years, mean age being 20.9 years. Commonest age group was 13 to 25 years (n=73).

Out of 100 operated patients, 81 (81%) had histo-pathological evidence of inflammation, while 19 (19%) had normal appendix thus giving rise to a negative appendectomy rate of 19%. The correlation of preoperative TLC with histo-pathological status of the appendix is given in Table-1.

Table-1: correlation of preoperative TLC with histo-pathological status of the appendix

Histopathology / TLC	Inflamed	Normal
$>10\times10^9$	62	5
$<10\times10^9$	19	14

Sensitivity and specificity of TLC as calculated in this study was 76.5% and 73.7% respectively while positive predictive value was 92.5%.

DISCUSSION

The symptoms in many of the patients with acute appendicitis may be very non-specific, mimicking other acute abdominal conditions.[6] The decision whether to operate or not may be important but equally difficult as surgical intervention carries a definite risk of morbidity and mortality.[11] TLC has been evaluated in many studies and was found helpful in increasing the diagnostic accuracy in patients with suspected acute appendicitis.[6,7,11]

Yang *et al* reported that TLC, neutrophils and CRP are helpful in diagnosis of acute appendicitis and patients with normal values in all the three tests are highly unlikely to have acute appendicitis.[12] Wu *et al* reported that TLC may serve as predictive parameter for early diagnosis of acute appendicitis in children.[13]

Various studies evaluating TLC in diagnosis of acute appendicitis have variable results. 80–85% patients with acute appendicitis will have TLC count of more than 10,000/cmm.[14] A raised TLC is regarded as sensitive test for diagnosis of acute appendicitis but is not diagnostic because of its lower specificity.[15]

The sensitivity (76.5%) and specificity(73.7%) determined in this study is comparable with various national[4,6] and international[4,12–15] studies in which sensitivity ranges from 80–88.7 %, while specificity ranges from 61.5 to 87 %.

The diagnostic value of TLC is increased when combined with neutrophilia and C-reactive proteins. Neutrophilia of more than 75% occurs in 78% of patients with acute appendicitis.[16,17] When neutrophil count and TLC are considered together about 4% of the patients will have normal values.[17]

Leukocyte count by itself is not completely preventive against negative appendectomy[18], a finding consistent with results of the current study. Another study on 200 children concluded that unlike adults normal leukocyte count and CRP does not rule out acute appendicitis in children.[19]

CONCLUSION

TLC although not a diagnostic criteria for acute appendicitis because of its low sensitivity and specificity but still it is a helpful investigation in decision making regarding appendicitis especially in doubtful cases and circumstances when senior surgical staff are not available in odd hours.

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