Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 07, pp.53439-53441, July, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLES

DIAGNOSTIC ACCURACY OF ACUTE APPENDICITIS WITH SIGNIFICANT PRE-OPERATIVE INFLAMMATORY MARKERS (TLC, NEUTROPHIL COUNT) AND POST-OPERATIVE HISTOPATHOLOGICAL DIAGNOSIS ENCOUNTERED AT RRMCH

[1*]Dr. Shashikala, K., [2]Dr. Usha Ramachandra and [3]Dr. Jeena Johns

[1]Assistant Professor, Department of Pathology, Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka
[2]Professor, Department of Pathology, Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka
Resident, Department of Pathology, Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka
[3]Department of Pathology, Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka

ARTICLE INFO

Article History:
Received 13th April, 2017
Received in revised form
18th May, 2017
Accepted 05th June, 2017
Published online 22nd July, 2017

Key words:

Acute appendicitis, Appendisectomy specimen, Inflammatory markers (TLC, Neutophil)

ABSTRACT

Background: Acute appendicitis is the most common abdominal surgical emergency and remains challenging diagnosis inspite of imaging techniques and acute inflammatory markers (TLC, Neutrophils).
Aims: The aim of the study is to prove the significance of inflammatory markers (TLC and Neutrophil Count) and correlation with histopathology in diagnosing acute appendicitis. Secondly to interpret how these investigations can be used effectively to improve the diagnosis, decision making and hence reduce negative appendicectomies.
Materials and methods: The study was conducted in the department of pathology and surgery. The clinical history of all the patients was taken. There was no gender discrimination and the age group included 15-50yrs. The clinical details diagnosing acute appendicitis with inflammatory markers (TLC, Neutrophil count) was correlated with histopathology sections of appendicectomies.
Results: In the present study Out of 250 patients, 182 were males and 68 were females with male to female ratio were 3.1: 1.70% of acute appendicitis were in the 2nd & 3rd decade and frequent symptom was pain in the right iliac fossa, with tenderness. Total Leukocyte Count was > 11000/mm^3 in 63% of patients and < 11000/mm^3 in 37% patients. Neutrophil Count was > 75% in 56% and < 75% in 44% of patients.
Conclusions: Simple laboratory investigations of Total Leucocyte Count and Neutrophil Count effectively improve the decision making of acute appendicitis and hence reduce negative appendicectomies.

Citation: Dr. Shashikala, K., Dr. Usha Ramachandra and Dr. Jeena Johns, 2017. "Diagnostic accuracy of acute appendicitis with significant pre-operative inflammatory markers (TLC, Neutrophil count) and post-operative Histopathological diagnosis encountered at RRMCH", *International Journal of Current Research*, 9, (07), 53439-53441.

INTRODUCTION

Acute appendicitis is an acute inflammatory condition presenting with right iliac fossa pain and most common cause of surgical emergencies with a risk of almost 7% (Sheikh *et al*., 2009). Patients with suspected appendicitis are diagnosed based on clinical history and physical examination and the value of laboratory examinations is controversial.

Corresponding author: **Dr. Shashikala, K.,**
Assistant Professor, Department of Pathology, Rajarajeshwari Medical College and Hospital, Bangalore, Karnataka.

Previous studies conducted with inflammatory markers have assessed the diagnostic accuracy of appendicitis. It is estimated that the accuracy of clinical diagnosis of acute appendicitis is lying between 76% and 92% (Sheikh *et al*., 2009). The risk of negative appendicectomy can be raised more than 20%, without the help of any diagnostic tool**.** Acute appendicitis with protean manifestations may simulate almost any other acute abdominal conditions. The correct diagnosis of the acute appendicitis is difficult. The diagnosis may be overlooked or misdiagnosed. The first error leads to an unnecessary operation and the second to delay. Ideally an accurate pre-operative diagnosis is required in order to avoid the unnecessary morbidity of a negative appendicectomy.

Delay in diagnosis and treatment can lead to complications like rupture, abscess and diffuse peritonitis. Factors which may lead to misdiagnosis include atypical clinical presentations, inflammatory and non-inflammatory conditions especially in females of child bearing age group, situs in versus, midgut malrotation and patients in the extremes of age. It has been well documented that there are certain inflammatory markers TLC and percentage neutrophil count help to evaluate the preoperative diagnostic assurance in patients with acute appendicitis who underwent appendicectomy at a later stage.

TLC is a commonly performed test in the diagnosis of acute appendicitis. It is easily determined and cost-effective investigation with sensitivity of 83.3%, specificity 62.1% and positive predictive value of 92%. The TLC count usually remains over 10,000 per mm in 80% of cases. Serial measurements in suspected cases may increase the specificity. DLC was attributed to neutrophil leucocyte count with 75% taken as upper normal limit in the studies conducted in the literature. The total and the differential cell counts should be interpreted in the light of physical findings as normal counts do not exclude appendicitis and raised counts and raised neutrophils can occur even in normal patients.

MATERIALS AND METHODS

A total 250 patients, of age groups between 15-50 years and both genders were included in this study. The clinical data of all the cases diagnosed as acute appendicitis from the Department of Surgery, RRMCH, were studied along with the appendicectomy specimens received for histopathology sections. Total and differential leucoyte count was recorded in each case and 10,000/mm^3 was taken as upper normal limit. DLC was attributed to neutrophil leucocyte count with 75% taken as upper normal limit. Inclusion criteria- All cases which have been clinically diagnosed as acute appendicitis and appendicectomy done. Exclusion criteria- All cases which have clinically been diagnosed as acute appendicitis but not operated and Chronic Appendicitis.

RESULTS

Out of 250 patients, 182 were males and 68 were females with male to female ratio were 3.1: 1. The incidence of acute appendicitis was maximum, 70% in 2nd & 3rd decade of life. Most frequent symptom was pain in the right iliac fossa, while tenderness in right iliac fossa was commonest physical sign. Total Leukocyte Count was > 11000/mm^3 in 63% of patients and < 11000/mm^3 in 37% patients. Neutrophil Count was > 75% in 56% and < 75% in 44% of patients.

Table 1. Age and Sex distribution (n=250)

Sex	Total No of Cases	Second decade	Third decade
Male	160	113	47
Female	90	54	36

Table 2. TLC versus Acute appendicitis

TLC	Total No of Cases (%)
Î[ed]	63%
N	37%

Table 3. Neutrophil Count versus Acute appendicitis

NC	Total No of Cases (%)
Î[ed]	56%
N	44%

Table 4. Correlation of Pre-operative inflammatory markers (TLC, NC) with Histopathological status of the appendix (n=250)

Histology	Î[ed] TLC, NC	Total No of Cases
Un-inflamed Appendix	6.8%	17
Acute uncomplicated Appendix	45.2%	113
Acute Complicated appendix	10.8%	27
Acute-on-chronic	37.2%	93

DISCUSSION

The cause of right iliac fossa pain continues to elude surgeons for more than a century. The cause may be acute appendicitis which requires surgery or something else that may not require intervention appendicitis. A high degree of diagnostic accuracy is required to reduce negative appendicectomies[1]. Studies revealed a rate of 15-20% for negative appendicectomies. Worm infestation, reactive hyperplasia and ectopic pregnancy in females can all mislead the diagnosis. Even a normal histopathological study cannot be an unusual happening. Enhancement of diagnostic yield is claimed by utilizing adjunct diagnostic tools. The commonly employed in this regard are total leucocyte count, Neutrophil count, CRP levels and USG abdomen and pelvis. As compared to ultrasound abdomen and pelvis, studies yielded better sensitivity and specificity for TLC. TLC is an easily performed test and is better standardized[1].

In 1901, Wilson noted the importance of differential count stating that 80-85% neutrophils was suggestive of pus (Raftery, 2005; Kamran, 2008; Muller, 2010; William *et al*.,). The degree of leucocytosis indicates the amount of body resistance and the degree of neutrophils indicates the severity of inflammatory processes.

In 1905, studies conducted by Greenough showed the use of total leucocyte count as an indicator for operation and a count of 15-30000/ cumm demanded immediate operative attention in doubtful cases (William *et al*.,) In 2005, studies conducted by A.T. Raftery concluded that leucocytosis of above 10000/mm^3 or a differential in excess of 75 per cent neutrophils confirms the clinical diagnosis of acute appendicitis (Raftery, 2005; Kamran, 2008). In 2005 studies conducted by P.W.R.Lee and N.V. Doraiswamy showed that in acute appendicitis neutrophilia supported the diagnosis and leucocytosis indicated the prognosis. In retrospective studies, TLC had a sensitivity, specificity and positive predictive value of 97.82%, 55.55% and 91.8%, respectively. Percentage of neutrophil count had a sensitivity, specificity and positive predictive value of 98.9%, 38.88% and 89.21% respectively. When used in combination, there was a marked improvement in the specificity and the positive predictive value to 88.04% and 98.7%, respectively (William *et al*.,). The combinations of simple laboratory investigations, TLC and Neutrophil Count along with thorough physical examination is essential for diagnosis of acute appendicitis.

Conclusion

The combination of simple laboratory investigations, Total Leukocyte Count and Neutrophil Count effectively improves the diagnosis and decision making of acute appendicitis and hence reduce negative appendicectomies.

REFERENCES

Appendicitis in pediatric age group correlation between preoperative inflammatory markers and postoperative histology diagnosis. University of Liverpool. *J Paediatric Surg* 2011 Sept-Dec; 8(3):309-12.

Kamran H, Naveed D, Nazir A.J. 2008. Role of total leucocyte count in the diagnosis of acute appendicitis. *Ayub Med Coll Abbottabad* Jul-Sept; 20(3): 70-1.

Muller AM, Kaucevic M, Coerot W. 2010. Appendicitis in Childhood correlation of clinical data with histopathological Findings. University Clinic Bonn, Dec; 222(7):449-4.

Raftery, A.T. 2005. The value of the leucocyte count in the diagnosis of acute appendicitis, *British Journal of Surgery* Dec; Vol 3, Issue 2:143-144.

Sadaf Ali, Omar J. Shah, Mubasshir Shah, Lateef Ahmed, Sajjad Mallik, Nazir A. Wan. Role of Total Leukocyte Count, Neutrophil Percentage, C - reactive protein And Ultrasonography in the Diagnosis of Acute Appendicitis. *The Internet Journal of Surgery* ISSN: 1528-8242.

Sheikh M, Misbha A, Farooq AR. 2009. Total Leucocyte Count, C-reactive protein and Neutrophil Count: Diagnostic Aid in Acute Appendicitis. *Saudi J Gastroenterol*. April; 15(2): 117–120.

William C, Harlan S. The clinical significance of the relation of total and differential leukocyte counts in acute appendicitis. From the surgical division, New York Hospital, New York City.

****