

ROLE OF LEUCOCYTE COUNT IN THE DIAGNOSIS OF ACUTE APPENDICITIS

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ABSTRACT

Background: The diagnosis of acute appendicitis is difficult and probably the most commonly encountered diagnostic problem in clinical surgery. The aim of the present work was to study the value of pre-operative leucocyte count in patients operated on for a clinical suspicion of acute appendicitis.

Material & Methods: This retrospective study conducted from January to October 2008 in DHQ and Allied Hospital Faisalabad. Five hundred consecutive patients operated in accident and emergency department of DHQ and Allied Hospital Faisalabad with the clinical suspicion of uncomplicated acute appendicitis were included in the study. Leucocyte count was checked before operation and acute appendicitis was confirmed by histological examination.

Results: The increase in leucocyte count was an early marker of acute appendiceal inflammation. In this study, leucocyte count was raised in 79.6% of patients with acute appendicitis. Only 2.4% patients have raised leucocyte count with normal appendix. In 7.6% patients, leucocyte count was normal but appendix was inflamed and in 10.4% patients, both leucocyte count and appendix were normal.

Conclusion: Leucocyte count is an important diagnostic criterion for the diagnosis of acute appendicitis. If it is normal, patient should be further investigated by ultrasonography or diagnostic laparoscopy.

Key words: Acute appendicitis, Total leucocyte count, Appendicectomy.

INTRODUCTION

The diagnosis of acute appendicitis is difficult and probably the most commonly encountered diagnostic problem in clinical surgery. The accuracy of diagnosis of acute appendicitis has improved only marginally in recent decades.¹⁻³ The classic triad of a history compatible with acute appendicitis, clinical examination and leucocytosis has a diagnostic accuracy rate of less than 80% and even when radiological techniques such as ultrasonography, computed tomography or radionuclide scanning are included, the accuracy does not usually reach 90%.³⁻⁷

Many surgeons have encountered patients who have been operated on for a clinical suspicion of acute appendicitis even though the preoperative leucocyte count was normal. It seems that in these cases an un-inflamed appendix is often found at appendectomy.

The purpose of the present work was to study the usefulness of pre-operative leucocyte count in patients operated on for a clinical suspicion of acute appendicitis.

PATIENTS AND METHODS

This retrospective study was conducted from January to October 2008 in DHQ and Allied Hospital, Faisalabad. All the patients operated with the diagnosis of acute appendicitis were included in the study regardless of the gender. Patients with complicated acute appendicitis like appendicular mass, abscess and peritonitis due to perforation were excluded from the study because there is usually no diagnostic problem in these cases. Children less than 12 years of age were also excluded as they were managed in paediatric surgery ward.

Five hundred consecutive patients who were operated with the diagnosis of acute appendicitis were included in the study. The diagnosis was confirmed in all cases by histological examination of the appendix. Blood samples were obtained from the patients at the time of admission. In those patients who underwent appendicectomy only after a period of observation, due to equivocal physical findings, an additional blood sample was taken two hours before operation and was used for total leucocyte count. The upper limit of the reference interval for leucocyte count was $9 \times 10^9/L$. The results of the laboratory tests were obtained within

1-2 hours and the surgeon on duty was thus aware of laboratory results before decision was made to operate.

RESULTS

Five hundred consecutive patients operated with the diagnosis of acute appendicitis were included in the study. Out of these 500, 218 (43.6%) were male and 282 (56.4%) were female. Ages of the patients were between 12 to 65 years. Ages of the patients are shown in Table-1.

Table 1: Ages of the patients.

Age (year)	Number of patients
12-20	153
21-30	241
31-40	71
41-50	18
51-60	12
61-70	5

The mean value for leucocyte count is shown in Table-2.

Table 2: Mean leucocyte count in different groups.

Group	Leucocyte count ($\times 10^9/L$)
Group A (n = 398)	14.5
Group B (n = 12)	9.8
Group C (n = 38)	8.8
Group D (n = 52)	6.4

The mean leucocyte count was significantly higher ($P < 0.001$) in patients with acute appendicitis. On the basis of results, patients were divided into four groups. (Table-3)

Table 3: Distribution of patients on the basis of leucocyte count.

Group	Total Leucocyte Count	Condition of appendix	Number of patients	Percentage
A	Increased	Inflamed	398	79.6
B	Increased	Normal	12	2.4
C	Normal	Inflamed	38	7.6
D	Normal	Normal	52	10.4

DISCUSSION

Acute appendicitis is more common in females and in 2nd and 3rd decades of life.^{7,8} Diagnosis of acute appendicitis is also much more difficult in females. The majority of our patients with un-inflamed appendix were also women due to gynaecological disorders which mimic acute appendicitis. In women, the diagnostic accuracy in acute appendicitis is usually as low as 60-70%.⁹ In women of child bearing age, the results are even less satisfactory with the diagnostic accuracy rates usually being lower than 60%.^{9,10} Laparoscopy has recently been recommended for all young women with right lower quadrant abdominal pain. It usually gives a precise diagnosis and reduces the rate of negative appendicectomies.^{11,12}

In group A, leucocyte count was raised and appendix was also inflamed. There were 398 (79.6%) patients in this group. It shows that leucocytosis is an important diagnostic criterion for the diagnosis of acute appendicitis.

In group B, leucocyte count was raised but appendix was found normal. There were only 12 (2.4%) patients in this group. Out of these 12 patients, 8 had non specific mesenteric lymphadenitis, 2 were having right salpingitis and 2 had urinary tract infection.

In group C, leucocyte count was normal but appendix was inflamed. There were 38 (7.6%) patients in this group. Although leucocyte count was normal but it is obvious from Table-2 that it is on higher side $8.8 \times 10^9/L$. It may be due to short time interval between onset of pain and estimation of leucocyte count.

In group D, leucocyte count was normal and appendix was also found normal. There were 52 (10.4%) patients in this group. The important observation is that average leucocyte count was only $6.4 \times 10^9/L$. Out of these 52 patients, 34 had non specific abdominal pain, 14 were having ruptured ovarian cyst and 4 had urinary tract infection. If we consider leucocyte count, appendicectomies could have been avoided in these patients.

CONCLUSION

Leucocyte count is an important diagnostic criterion for the diagnosis of acute appendicitis. If it is normal, patient should be further investigated by ultrasonography or diagnostic laparoscopy.

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