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WBC COUNT, DURATION OF SYMPTOMS AND AGE IMPACT ON ACUTE APPENDICITIS AND SEVERITY OF DISEASE

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Abstract:
Aim: To determine the relationship between the severity of acute appendicitis and the number of white blood cells, age and duration of symptoms.
Study design: A cross-sectional study.
Place and duration: In the Surgical department of District Headquarters Hospital Rawalpindi for one year duration from April 2019 to April 2020.
Method: 242 patients with clinical and histological diagnosis of acute appendicitis were included in the study. Patients with simple acute appendicitis, purulent appendicitis, perforated appendicitis, or gangrenous appendicitis were included. Histological verification was performed on all samples.
Results: Of the 242 patients, 174 are men and 68 women. The average age at the time of presentation for men was 22.68 ± 6.88, and for women 18.97 ± 5.37 days. The mean duration of symptoms was 1.98 ± 1.83 days in men and 1.52 ± 0.81 days in women. The mean duration of symptoms for simple acute appendicitis (group 1) was 1.92 ± 1.71, for purulent appendicitis (group 2) 1.38 ± 0.5, and for perforated appendicitis (group 3) 1.38 ± 0.69. The mean white blood cell counts for simple acute appendicitis, purulent appendicitis, and perforated appendicitis were $10,907.11 \pm 3029,56$, $10,300 \pm 2401.38$ and $12,461.11 \pm 3643.22$, respectively. No gangrenous appendicitis was observed. It was found that patients aged 25–35 have the highest number of WBC in various groups of severity of acute appendicitis ($P = 0.004$). No gangrenous appendicitis was observed. There was no significant relationship between the number of WBC and severity of results in appendicitis. There was a significant correlation between different age groups and the severity of the disease ($P = 0.042$).
Conclusion: White blood cell counts and duration of symptoms are not good predictors of disease severity in appendicitis. In the adult population, an increase in age below 45 years increases the risk of appendicitis complications.
KEYWORDS: attachments, complications

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INTRODUCTION:

Acute appendicitis is one of the most common surgical emergencies in the abdomen. Due to the increased morbidity and mortality associated with complications of simple appendicitis, surgeons had to operate on patients and did not expect a final diagnosis[1-2]. This led to the removal of normal appendix in 15 to 30% of patients. Because many patients have a typical history and test results, the diagnosis is clinically determined. Etiology is multifactorial; Obstruction of light contributes to diet and family factors[3-4]. The diagnosis of acute appendix remains a dilemma due to the different history and test results that an individual patient can offer. Delayed arrival or incorrect diagnosis by a doctor can lead to serious consequences in cases of appendicitis[5-6]. The number of white blood cells has been shown to provide valuable information in the diagnosis of acute appendicitis. Salman also observed an increase in the number of white blood cells and the severity of the disease in his study[7-8]. Patient age plays an important role in determining the possibility of appendicitis complications such as perforation, and patients over the age of 50 are at risk[9].

The authors conducted this study to determine whether the number of white blood cells, the patient's age and duration of symptoms were related to the severity of the disease in cases of acute appendicitis.

METHOD:

It is a cross-sectional study held in the Surgical department of District Headquarters Hospital Rawalpindi for one-year duration from April 2019 to April 2020 and includes patients who underwent surgery for appendicitis. 242 patients were included in the study. Only patients whose surgical and histological results were fully compatible were included in the study. Simple histology of acute appendicitis or one of its complications such as suppuration, perforation or gangrene has been proven in these patients.

Patients were divided into 3 groups of patients.
1. Simple acute appendicitis

2. Purulent appendicitis.
3. Perforated / gangrenous appendicitis

No cases of gangrenous appendicitis were reported during surgery or histology. The parameters included in the study were patient demographics, duration of symptoms, white blood cell count, and histological results of the appendix sample. In leukocytosis, 10,000 or more white blood cells are considered positive. Patients were divided into 12–25 (group 1) 26–35 (group 2) and 36–45 (group 3) age groups. All analyzes were carried out using the SPSS 17.0 production facility. For statistical analysis, we used the One-Way ANOVA and Spearman correlation. A probability value of <0.05 has been assigned to show significance.

RESULTS:

242 patients were included in the study. There were 174 men (71.9%) and 68 women (28.1%). The average age of male application is 22.68 ± 6.88, and the average age of female candidates is 18.97 ± 5.37. The mean duration of symptoms was 1.98 ± 1.83 days in men and 1.52 ± 0.81 days in women. The mean duration of symptoms of simple acute appendicitis (group 1) was 1.92 ± 1.71, purulent appendicitis (group 2) 1.38 ± 0.5, and perforated appendicitis (group 3) 1.38 ± 0.69. Leukocytosis was present in 176 (72.72%) of all cases with 123 (69.88%) men and 53 (30.11%) women. The average number of white blood cells in simple acute appendicitis was $10,907.11 \pm 3029.56$ in 211 patients. The average was 10300 ± 2401.38 for purulent appendicitis in 13 patients. In perforated appendicitis, the mean was $12,461.11 \pm 3643.22$ for 18 patients. Table I shows the number of patients belonging to different age groups. There was no significant relationship between the severity of acute appendicitis and the number of WBC ($p = 0.08$). The mean duration of symptoms in patients with varying degrees of acute appendicitis was also not considered significant ($p = 0.227$). There was a significant difference between the average white blood cell counts and different age groups ($p = 0.004$). There was also a positive correlation ($r = + 0.131$) between the severity of acute appendicitis in different age groups ($p = 0.042$).

Table I. Number of patients in different in age and disease groups

	Age Group I (12-25 Years)	Age Group II (26-35 Years)	Age Group III (36-45 Years)	Total
Patient Group I	171	35	5	211
Patient Group II	8	4	1	13
Patient Group III	12	6	0	18
Total	191	45	6	242

DISCUSSION:

Appendicular rupture represents the majority of complications of acute appendicitis. Various factors have been found to play a role, such as late presentation of medical care, very young places, and old and variable additional pages. Compliance rates, length of hospital stay and resource consumption increase significantly with perforation[9-10].

It has been shown that the risk of complications in patients over 50 is absolutely higher. The authors observed a significant positive relationship (p = 0.04) (+0.131) between the severity of appendicitis and the increase in age in various age groups. The limitation of this study is the absence of patients older than 45 years (Table I). However, this also indicates an increase in the severity of the disease, not only in extremes, but also in patients aged 12 to 45 years.

Imaging studies, such as ultrasound, have not been very useful in diagnosing acute appendicitis[11-12].
In the past, a significant number of point systems have identified white blood cell counts as an inflammatory marker for assessing acute appendicitis. The first demagnetization of peripheral white blood cells resulting from catecholamine and cytokine secretion explains leukocytosis in most patients with acute appendicitis. In this study, the authors found no relationship between white blood cell counts and disease severity in acute appendicitis (p = 0.08). On the other hand, the authors observed a significant difference in the average number of white blood cells in patients of different age groups (p = 0.004) under the age of 45[13-14].

The discussion about surgical appendicitis in acute appendicitis is more active than ever. Studies have shown that the severity of appendicitis is time dependent and the delay in appendicitis is uncertain. Another study showed that the increased risk of complications is negligible during the first 24 hours, but increases gradually over time. The authors observed that the average duration of symptoms did not differ significantly in patients with varying severity of acute appendicitis (p 0.227), i.e. the duration of symptoms in patients with appendicitis. Emergency appendectomy is traditionally the standard treatment method to minimize the risk of complications associated with the progression of the disease into gangrene and perforation. The absence of gangrenous appendicitis in patients with a wide range of symptoms in this study may indicate that the acute complication of acute appendicitis in our society is rare[15].

CONCLUSION:

As a result, this study showed that the number of white blood cells and the average duration of symptoms are not independently useful markers for predicting the risk of developing a serious disease in acute appendicitis. Early operational decisions cannot be based solely on the number of white blood cells and the duration of symptoms. Like older people, middle-aged patients are more likely to have severe types of appendicitis compared to puberty and young adults, so the decision must be swift. Due to the variable results of research carried out in different parts of the world, to solve the diagnostic and operational dilemmas of acute appendicitis, multicenter data analyzes with large and variable population groups are needed.

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