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C-Reactive Protein can be use as a Diagnostic Tool for Acute Appendicitis

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ABSTRACT
Background: Diagnosing and treating appendicitis is a common surgical emergency. Based on a thorough history, physical examination, test results, and imaging studies, an accurate diagnosis of acute appendicitis can be made. Correct diagnosis is frequently challenging since the patient's age and the location of the appendix might affect the clinical presentation. This study aimed to determine the C- reactive protein's clinical usefulness as an appendicitis diagnostic test.
Materials and Methods: An eight (08) months cross-sectional study was performed done between March and October, 2021. The study was conducted at the tertiary care hospital. In this study, 116 patients were included. Clinical details, examination, and history were noted. All patients having negative HBsAg, and Anti-HCV, required emergency surgery irrespective of age and gender were included in the study. All collected data were entered and analyzed through Microsoft Excel 2016.
Results: A total of 116 appendicitis patients were studied in which majority patients were in age range from 18-30 years with 62.1% and 37.9% were observed in age between 31 to 45 years. Male patients were found frequently with 56.9%. CRP was positive in majority patients with 84.4% acute appendicitis.
Conclusion: Acute appendicitis is not likely to be recognized in preoperative instances with increased CRP values. When a patient is suspected of having acute appendicitis, a standard laboratory test assessing CRP should be implemented. Acute appendicitis can be diagnosed with this test and utilized as a surgical indication marker.
Keywords: Acute, Age, Gender, Pakistan, Appendicitis, CRP, Protein

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INTRODUCTION

Around the world, including in our country, acute appendicitis is a common cause of stomach discomfort that necessitates emergency surgery.[1] When a patient has severe abdominal pain, acute appendicitis is still frequently the cause of the surgical emergency.[2] In older adults, normal textbook signs and symptoms are frequently aberrant, reduced, or missing. Similar to this, early children's signs and symptoms are non-specific because of the variety of potential reasons and their incapacity to provide a precise history. As such, diagnosing appendicitis might be difficult.[3] Blood tests are frequently used by doctors to support and enhance diagnosis accuracy, even though clinical acumen is still the most significant diagnostic tool in cases of acute appendicitis.[4] When managing a patient, the usefulness of C-reactive protein (CRP) is invaluable. It is essential for lowering the negative appendicectomy rates, which as of late (20.6% according to a recent audit study).[5]

While computed tomography (CT) and ultra-sonography (US) can also be useful, clinical evaluation is the primary method used to diagnose acute appendicitis.[4, 6] In an effort to increase diagnosis accuracy, several studies have examined a variety of straightforward blood tests and clinical criteria throughout the years. Nowadays, clinical evaluation is frequently guided by the white cell count (WCC) and C-reactive protein (CRP).[7] However, previous research has shown that CRP measures have sensitivities ranging from 40% to 94% and specificities of 38-87%.[8] More precise results have been obtained by certain groups: increased CRP levels have been demonstrated to be correlated with complications such appendix abscess or perforation.[9] Nevertheless, all of these investigations have been retrospective in nature, concentrating on blood tests performed on appendectomy patients.[10] When diagnosing probable appendicitis, white blood cell (WBC) counts and C-reactive protein (CRP) levels are frequently employed; however, the investigations' sensitivity and specificity range greatly from one another.[11] There are challenges in correctly and quickly detecting and treating appendicitis. Patients must be given surgical intervention priority according to the severity of their conditions, and several differentials must be ruled out. Reducing the morbidity rate continues to be dependent on the timely and accurate therapy of appendix patients.[1, 12]

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It is seldom easy to determine the surgical reasons for appendicitis in clinical practice. It has been shown that a standard blood analysis that includes the serum level of CRP is significant in the diagnosis of appendicitis, rather than in the indication for surgery.[13] The value of CRP as a surgical indicator of appendicitis has not, however, been assessed in any publication. The purpose of this study was to evaluate the C-reactive protein in individuals suffering from acute appendicitis.

MATERIAL AND METHODS

This descriptive cross-sectional research was performed in tertiary care hospital, Pakistan. The study conducted in eight (08) months, in which 116 patients were recruited over the research period. Detail clinical history, examination, and routine laboratory tests were noted. All patients have negative serological tests including HIV, HBsAg, and HCV were recruited for the surgical procedure. Moreover, all ages, both genders, and all ethinicity patients were included in the study. Patients have hepatitis positive history, and unavailble of clear picture of clinical history were excluded from the study. Additionally, coronary syndromic patients, pelvic inflammantory diseases, chronic liver disease and urinary tract infected patients were also excluded from the study.

Ethical approval from hospital administration were obtained before conducting the study. Whereas informed consent were signed and taken from patients or their guardian before conducting surgical procedure and this research.

Blood obtained from patients upto 3ml in gel tube and forwarded to emergency hospital laboratory for CRP and serological testing. Blood was centrifuge on 2000 rpm and serum were separated in the collection tube. CRP on latex card were detected either positive or negative of patients. CRP results were observed along with demographic data on designed preforma.

All collected data were entered and analyzed through Microsoft Excel 2016. Data were presented using the tables.

RESULTS

Upon examining the age-wise, 116 patients in this study, it was discovered that 62.1% and 37.9% of the patients, respectively, belonged to the 18–30 and 31–45 age groups. According to the gender-wise, 56.9% and 43.1% male and female patients respectively (Table 1).

Table 1: Patients were distribution age-wise

Age	Percentage (Frequency)
18-30 Years	62.1% (72)
31-45 Years	37.9% (44)
Total	100% (116)
Gender	Frequency
Male	56.9% (66)
Female	43.1% (50)
Total	100% (116)

It was observed that CRP was found positive in 84.4% individuals and 15.6% were found negative CRP in acute appendicitis (Table 2).

Table 2: Frequency of C-Reactive Proteins among Acute Appendicitis patients

CRP Findings	Percentage (Frequency)
Negative	15.6% (18)
Positive	84.4% (98)
Total	100% (116)

DISCUSSION

In cases of acute appendicitis, CRP monitoring improves diagnostic accuracy.[14] Our findings indicate that elevated serum CRP levels corroborate the surgeon's clinical diagnosis of acute appendicitis, which is still mostly made clinically. In cases of complex appendicitis, postponing treatment increases the risk of complications, lengthens hospital stays, and raises healthcare expenses.[15] To prevent postoperative consequences of established infection and collection, several studies have discussed and suggested offering these patients open surgery straight from the start. Surgical management has been the primary treatment for appendicitis.[16] On the other hand, successful non-surgical therapy of appendicitis has also been reported. Some have questioned the long-standing practice of interval appendectomy, suggesting that individuals may never require an appendectomy if they do not experience recurring bouts of appendicitis within three to six months.[17] Consequently, the doctor is often confronted with the choice of whether to treat a patient with appendicitis surgically or with antibiotics. Doctors usually try to determine the severity of an appendicitis diagnosis before determining the best course of action. If doctors could predict the severity of appendicitis, they could then choose the best course of therapy and when to do surgery.[18] A surgical indication marker like a CRP may be useful in deciding whether to treat the patient with antibiotics or surgery.[18, 19]

Clinicians assessing clinical data must rely on their subjective judgment and diagnostic modalities, such as computed tomography and ultrasound, to make a diagnosis of appendicitis before applying our approach for surgical indication.[20, 21] They also need to rule out other possible sources of symptoms. It was a single-center research with a limited sample size, nonprobability sequential sampling, and a qualitative CRP detection method. This study's data did not include the length of time that symptoms persisted before peripheral venous blood was taken. This affects the inflammatory markers' laboratory values and is a topic for further research.

CONCLUSION

It was shown that most patients with acute appendicitis received a report on CRP. CRP is

helpful in the diagnosis of acute appendicitis. This work will help surgeons make the connection between laboratory and clinical studies. Future directions for this sort of study will also be made possible by the findings. This will make it easier to quickly connect patients to the best medical institution and to identify and treat any issues as soon as they arise.

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