



General Surgery

EFFICACY OF C-REACTIVE PROTEIN ASSAY IN DIAGNOSIS OF ACUTE APPENDICITIS

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ABSTRACT

Background: Appendicitis as pain in Rt Iliac fossa is the commonest Surgical Emergency and Appendectomy is one of the commonest procedures in surgery. In spite of various investigations used to improve the accuracy of diagnosis, the rate of normal appendices removed is still about 15–30%. Negative Appendectomy is done very much. C-Reactive Protein is also altered in Acute Appendicitis. The aim of this study was to assess the efficacy of C-Reactive Protein to diagnose Appendicitis. **Methods:** In a retrospective study, C-Reactive Protein assay was done in 100 patients who were operated for appendectomy due to Acute Appendicitis and all specimens sent for histopathology. A correlation was drawn between the value of C-reactive protein and histopathological status of Appendix taking note of age, sex, clinical features of patient. **Results:** CRP was high (> 10 mg/L) in 81 individuals with falsely raised in 5 patients. Sensitivity of CRP > 10 mg is 85.39%, specificity of CRP > 10 mg is 54.54%. Histopathologically 32% were classified as inflamed, 34% suppurative, 17% gangrenous, 13% perforated, and 5% necrotizing appendicitis. CRP of 40 or more is associated with suppurative or inflammatory, more than 100 in Perforated or Gangrenous appendicitis. **Conclusions:** Our result shows that C-Reactive protein is high in Acute Appendicitis and increases very high if Appendix is more damaged histologically, so it helps in diagnosis of Acute Appendicitis and helps the surgeon to take decision and avoid negative Appendectomy.

KEYWORDS : C-Reactive Protein, Appendicitis, Appendectomy.

INTRODUCTION:

Acute appendicitis remains a common surgical emergency in patients presenting with acute Rt iliac fossa pain. Appendectomy is one of the commonest procedures in surgery. In spite of various investigations used to improve the accuracy of diagnosis, the rate of P:2 normal appendices removed is still about 15–30%. Negative Appendectomy is done very much. Therefore, appendicitis is a challenging diagnosis to make. Although clinical acumen remains the most important diagnostic tool in acute appendicitis, clinicians often rely on blood tests, ultrasound, CT Scan etc to diagnose Appendicitis accurately. The rising value of C-reactive protein (CRP, N= 0 to 10 mg/l) is very helpful. It prevents negative appendectomy which is still 15–30%. CRP is an acute-phase reactant synthesized by the liver in response to infection or inflammation and rapidly increases within the first 12 h. CRP has been reported to be useful in the diagnosis of appendicitis and very high levels of CRP in patients with appendicitis indicate gangrenous, perforation or suppurative appendicitis, if it is associated with leukocytosis and neutrophilia. However, CRP normalization occurs 12 h after onset of symptoms. Several prospective studies have shown that, in adults who have had symptoms for longer than 24 h, a normal CRP level has a negative predictive value of 97–100% for appendicitis sensitivity of CRP > 10 mg is 85.39%, specificity of CRP > 10 mg is 54.54%. Shogilev et al noted that a normal CRP level after 12 h of symptoms was 100% predictive of benign, self-limited illness. High Alvarado score is very important and if it is with high serum CRP, Appendicitis is accurately diagnosed.

MATERIAL & METHODS

This study included 100 patients who were operated for Appendectomy after clinical examination, & investigations over a period of 02 yrs from May 2020 to April 2022. Serum CRP concentrations were measured before the operation by the CRP kit. Normal CRP levels range from 0 to 10 mg/l (negative). We did not take into account preoperative serum CRP value for the decision of the appendectomy. Depending on results of the clinical examination by a surgeon, patients underwent surgery of acute appendicitis. Operative finding and histopathological examination of appendectomy specimens established the exact diagnosis. CRP values are compared with final histopathology report and sensitivity, specificity calculated.

RESULTS

In a study of 100 patients of suspected cases of acute appendicitis, males comprised 70 and females 30. Age Group of Male is in range of 12 to 60 yrs (12–20=20, 21–45=40, 46–60=10) and Female (12–20=08, 21–45=20, 46–60=10) were of age 14 to 55 yrs. Histopathology confirmed 89 cases of acute appendicitis and 11 cases

of chronic appendicitis. In this study, CRP was high (> 10 mg/l) in 81 individuals, and among them, 05 individuals seemed to have falsely raised CRP. In this study, the sensitivity of CRP is 85.39%, and specificity is 54.5%. Histopathologically, out of 100 appendectomies, 34 were classified as inflamed, 32 suppurative, 20 perforated, 10 gangrenous and 04 necrotizing appendix. CRP of 40 or more is associated with suppurative or inflammatory, more than 100 in Perforated or Gangrenous appendicitis.

DISCUSSION

In this study 100 appendectomies performed by the surgeon on the basis of clinical examination supported with investigations of total leucocyte count, ultrasound and Alvarado score etc. Estimation of serum C-Reactive Protein was estimated and all removed specimens submitted for histopathological examination. With the onset of infection, there was an increase in the secretion of acute-phase proteins as CRP from the liver, and their serum concentrations augment 8–12 hours after the onset of infection. CRP is a marker of acute phase response and can be used as an indicator of disease severity. Elevation of serum concentrations of CRP indicates the presence of Acute Appendicitis. In this study, CRP was high (> 10 mg/l) in 81 individuals, and among them, in 05 individuals seemed to have falsely raised CRP. In this study, the sensitivity of CRP is 85.39%, and specificity is 54.5%. A recent meta-analysis showed that when both an elevated WBC count and high C-reactive protein level are present, there is a five-fold increase in the positive likelihood ratio for acute appendicitis. So, routine performance of the CRP test can prevent negative laparotomies therapy. Multiple studies have examined the sensitivity of CRP level alone for the diagnosis of appendicitis in patients selected to undergo appendectomy. Gurleyik et al noted a CRP sensitivity of 96.6% in 87 of 90 patients with histologically proven disease. Similarly, Shakhathreh found a CRP sensitivity of 95.5% in 85 of 89 patients with histologically proven appendicitis. Asfar et al reported a CRP sensitivity of 93.6% in 78 patients undergoing appendectomy.

Statistical Analysis

Tab 1. Age & Sex Wise Distribution

Age Group	Male	Female
12-20	20	08
21-45	49	20
46-60	10	02

Tab 2. Histopathological finding & CRP

TYPE OF APPENDIX	Cases	CRP VALUE mg/l
INFLAMMED	34	10-15
Suppurative	32	16-20

Perforated	20	21-30
Gangrenous	10	31-50
Necrotising	04	51-150

Table 3:Other positive investigations

Type	Cases	Percentage
RI fossa Pain	100	100
Leucocytosis	70	70
Ultrasonography	40	40
Vomiting/Fever	30	30

CONCLUSIONS

1. Serum C-reactive protein, when elevated, supports the surgeon's clinical diagnosis of acute appendicitis.,
2. CRP can be used frequently to diagnose acute appendicitis so that the complication rate and negative laparotomies can be avoided..
3. It is advisable to observe atypical patients with serial clinical examinations and CRP tests when there is doubt about the diagnosis.
4. CRP value is very high in perforated gangrenous appendix in histopathological examination,so if it ivery high,prompt appendectomy should be done.

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