

C - REACTIVE PROTEIN (CRP) AS A DIAGNOSTIC PARAMETER IN ACUTE APPENDICITIS – A DOUBLE BLIND STUDY

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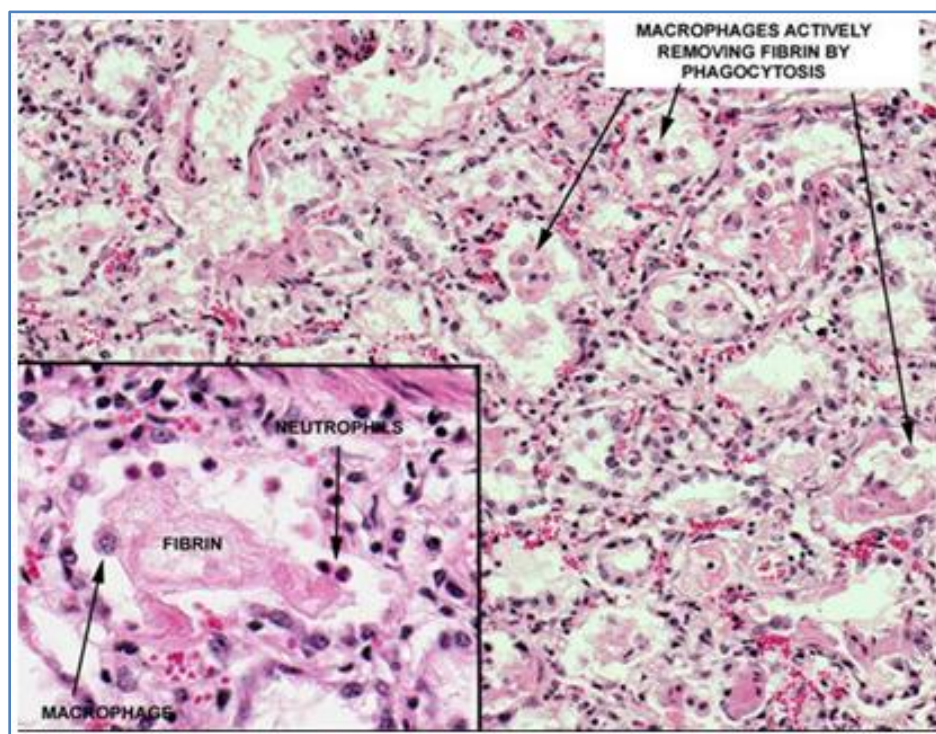
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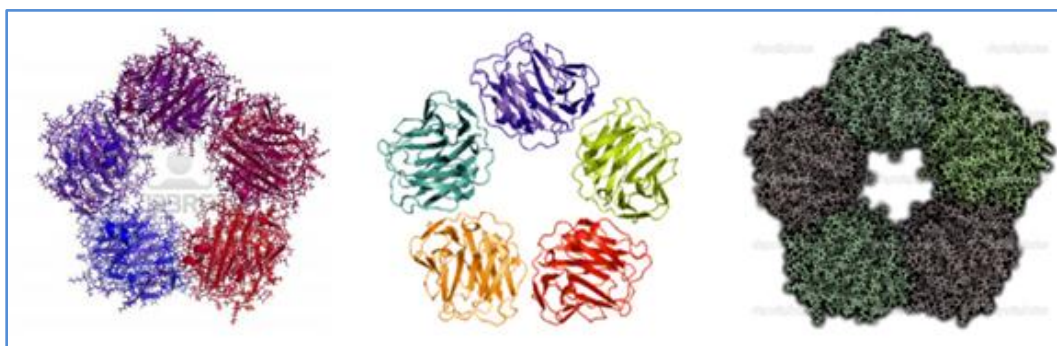
ABSTRACT: BACKGROUND AND OBJECTIVES: Acute appendicitis is one of the most common causes of right iliac fossa pain and one of the most common cause of surgical emergencies. The clinical trial of history compatible with acute appendicitis, pain at McBurney's point and leucocytosis has diagnostic accuracy rate of less than 80%. Hence high rate of about 15-30% of negative explorations for acute appendicitis is unacceptable in today's era of evidence based medicine. So the objective of the study was to evaluate the role of accuracy of CRP measurement in the diagnosis of acute appendicitis and to reduce morbidity by avoiding negative explorations.

METHODS: The present study was conducted in 50 patients at the department of Surgery, MMC & RI, Mysore have been clinically diagnosed by surgeons as having acute appendicitis and posted for emergency appendectomy. Preoperatively blood was sent for CRP estimation, (more than 10,000 per mm³) after operation all specimens were sent for HPE examination; results of CRP were correlated with HPE reports to evaluate their role in diagnosis of acute appendicitis.

KEYWORDS: CRP- C-Reactive Protein, HPE- Histopathological Examination.



Slide showing ulcerated and necrotic mucosa



Structure of CRP



Apparatus used for serum CRP estimation

RESULTS: In present study, CRP has highest sensitivity and specificity of 97.7% and 85.7% with positive predictive value of 97.7%. Hence it was proved that CRP level can be used to rule out negative appendicitis, so that surgery can be deferred in them and to reduce rate of negative appendicectomies.

INTERPRETATION AND CONCLUSION: With unaltered rate of negative appendicectomy, appendicitis has continued to represent a diagnostic and therapeutic challenge to surgeon.

Hence additional tests are required to improve the diagnostic accuracy of appendicitis and to reduce burden on society.

However elevated serum CRP levels support the surgeon's diagnosis and hence avoid chances of error in diagnosis, due to atypical presentations.

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INTRODUCTION: Acute appendectomy is one of the most common surgical emergencies but still atypical presentations are not uncommon as very inflammatory and non-inflammatory conditions, may mimic the presentation of acute appendicitis.

So the diagnosis of acute appendicitis is important for surgeon, and the exact diagnosis is important for proper management. The goal of surgical treatment is removal of inflamed appendix before perforation, with minimal number of negative appendicitis.

CRP together with other acute phase proteins increases response to tissue injury. Many reports have investigated the value of raised serum CRP measurement in improving the diagnosis of acute appendicitis¹.

In this study we correlated the serum CRP level with HPE of removed appendix.

MATERIALS AND METHODS: All the patients who are admitted to hospital during the study period with diagnosis of acute appendicitis and posted for surgery are included in this study after taking written consent.

METHOD OF COLLECTION OF DATA: Patient coming to emergency ward with acute abdominal pain was examined by a surgeon for establishing the diagnosis; it was followed by routine laboratory test and radiography. In all the cases diagnosis was established by detecting right quadrant tenderness, guarding and rebound tenderness at physical examination and decided by surgeon, if emergency appendectomy is necessary or not.

Serum CRP level of all the patients were done before operation by latex agglutination method. Normal value of serum CRP is 0.1 to 0.8 mg/dl. Value above 2.5mg/dl suggests an ongoing inflammatory process and was considered as positive². After operation appendix specimen were sent for HPE, to establish final and exact diagnosis. Accordingly true and false positive, serum CRP result were determined, to calculate its specificity and sensitivity.

RESULTS AND ANALYSIS: In our study 50 cases were included who were diagnosed as having acute appendicitis clinically by surgeons and informed consent was taken. It was noted in our study that maximum number of patients were in the age group of 21-30 years, constituting of 40% of study group with female preponderance of 54%.

With respect to clinical features 90% of patients presented with McBurney's tenderness and only 20% showed shifting tenderness. Out of 50 patients 7 patients had normal appendix on HPE. Hence our negative appendectomy rate was 14%. In HPE, 58% of patients had acute suppurative appendicitis. In present study 43 patients had elevated serum CRP level (more than 2.5ml/dl), which is 86% of total study group. In these patients only 1 patient had high serum CRP level inspite of normal appendix on HPE due to mesenteric lymphadenitis which was found during surgery.

7 patients had normal serum CRP value i.e. 14% of study patients. In these patients normal appendix on HPE was found in 6 cases i.e. 85.7%. So in our study 96% of the CRP test done are true whether level was raised 'or' it was normal only in 2 cases (4% of study) test done for CRP level estimation gave false report. Therefore CRP level estimation has sensitivity of 97.7% with specificity of 85.7% and positive predictive value of 97.7%.

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DISCUSSION: In study of "C-reactive protein as a diagnostic parameter in acute appendicitis-A double blind study" the diagnostic value of serum CRP levels in patients with clinically suspected acute appendicitis was investigated and after the study it was noted that negative appendectomy rate was 14% which was comparable to study done by Vinoth Kumar et al. 2011 with a negative rate of 10% and Shozoyokoyana et al. 2007 with a negative rate of 8%.^{3, 4}

In our study sensitivity rate is 97.7% and specificity is 85.7% which were compared with study done by Khan MN et al. 2004 in which he demonstrated the specificity of CRP to be 83.7% and A.V Kyriakidis et al. 2010 demonstrated sensitivity of CRP to be 97.27% and specificity of 99.34%.^{5, 6}

Hence, our study demonstrated the valuable contribution of pre-operative serum CRP measurement to the clinical diagnosis of acute appendicitis.

SUMMARY: Even today clinical examination is indispensable in diagnosing acute appendicitis, and all the other investigations complement clinical skill and does not replace it. Our study was done to determine the accuracy of serum CRP measurement in the diagnosis of acute appendicitis, and it was concluded that serum CRP has highest sensitivity and specificity. Hence it proves definite association between raised serum CRP and acute appendicitis, and CRP stands as best laboratory test which can be used to reduce negative appendectomy rate drastically.

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