Original article:

A study of C-reactive proteins and clinico-pathological profile in cases of acute appendicitis in rural set up at AVBRH, Sawangi(m), Wardha

***Dr Suvit Jumde[1], Dr Harshal Ramteke[2]**

[1]Department of Surgery,Jawaharlal Nehru Medical College,Wardha, Maharashtra, India

[2]Department of Surgery, Jawaharlal Nehru Medical College,Wardha, Maharashtra, India

Corresponding author*

Abstract:

Acute appendicitis is a common cause of acute abdominal pain, which can progress to perforation and peritonitis, associated with morbidity and mortality. Diagnosis of acute appendicitis is currently based on clinical features pointing towards Appendicitis. Several biochemical parameters, such as the white blood cell (WBC) count, capsular (C) polysaccharide of pneumococcus-reactive protein (CRP) level, and neutrophil percentage, are currently used to aid clinical diagnosis. Negative Appendicectomy has become a burden not only to the health-care systems and patient suffering but also to a reduced quality of life in adults, especially in children.Therefore we undertook this study to evaluate the utility of CRP as a diagnostic tool among patients clinically suspected to have acute appendicitis.

Keywords: acute appendicitis, C-Reactive Protein, clinic-pathological.

Introduction

Acute appendicitis is a common cause of acute abdominal pain, which can progress to perforation and peritonitis, associated with morbidity and mortality. The lifetime risk of appendicitis is 8.6 % for males and 6.7 % for females; however, the risk of undergoing appendectomy is much lower for males than for females (12 vs. 23 %) and it occurs most often between the ages of 10 and 30, with a male:female ratio of approximately 1.4:1[(1)]

Diagnosis of acute appendicitis is currently based on clinical features pointing towards Appendicitis. Several biochemical parameters, such as the white blood cell (WBC) count, capsular (C) polysaccharide of pneumococcus-reactive protein (CRP) level, and neutrophil percentage, are currently used to aid clinical diagnosis.[(2,3,4)] Delay in diagnosis can result in serious complications as diffuse peritonitis, liver abscess, abdominal or retroperitoneal abscess, phlegmon, intestinal obstruction, bacteremia, sepsis, necrotizing fasciitis, and appendicovesicalfistula.[(5,6,7)]

Negative Appendicectomy has become a burden not only to the health-care systems and patient suffering but also to a reduced quality of life in adults, especially in children.[(2)] Diagnostic bias in patients with atypical clinical findings has resulted in unnecessary appendectomies, variably between 8% and 33% with an average of about 20%; some literature has reported it to 15-30 % of total cases and Perforation may occur in up to 35% of cases.[(8)]

No definite method is currently available to distinguish complicated from uncomplicated appendicitis preoperatively, despite the fact that several studies about predicting complicated appendicitis were published [(7,9,10,11,12)]

The white cell count (WCC) and C-reactive protein (CRP) are now often used to guide clinical assessment but past studies have demonstrated sensitivities of CRP measurements ranging from 40% to 94%, and specificities of 38–87%.[(13,14,15)]

Therefore we undertook this study to evaluate the utility of CRP as a diagnostic tool among patients clinically suspected to have acute appendicitis.

Materials and Methods

The present study entitled "A study of C-reactive proteins and clinico-pathological profile in cases of acute appendicitis" was carried out in the department of general surgery, Acharya VinobaBhave Rural Hospital, affiliated to Jawaharlal Nehru Medical College, Sawangi, Wardha, from April 2014 to September 2016.

100 patients admitted to the surgery ward with acute abdominal pain clinical features of Acute Appendicitis and those who had given consent for the above study were included in the study.

White blood cell and differential counts would be measured by the hematologyAnalyzer (Beckman Coulter).

The C-reactive protein concentration would be quantified by a Latex agglutination slide test for qualitative and semi-quantitative determination in Non-diluted serum (Humatex, Wiesbaden, Germany) at our own institute.

The serum CRP concentration would be estimated by multiplying the dilution factor from the last dilution with visible agglutination by the detection limit (6 mg/l).

The Levels above 6 mg/L would be considered as being above normal.

Surgery in required cases was done under general anaesthesia or spinal anaesthesia. In emergency Laproscopic appendectomy is not done at our Institute. Laproscopic appendectomy cases were not included in this study. Since the mode of surgery was not relevant as it was only required for histopathological diagnosis, this factor did not affected our study. Abdomen was opened by McBurney's, Grid iron or right Para median incision. After completion of appendectomy the specimen was subjected to histopathological examination by the qualified pathologist.

Inclusion Criteria:

Patients of any age group and both sexes presenting to surgery department with acute abdominal pain, having clinical suspicion of acute appendicitis were considered for study.

The patient who had given consent for taking part in study

Exclusion Criteria:

Patients having acute intestinal obstruction, Inflammatory arthritis, Autoimmune disorders, Neoplasia, Pregnancy, Burns, Acute Myocardial Infarction, Other causes which increase the CRP levels

Observations and Results:

Table : Age wise distribution of patients in appendicitis

Age Group (yrs)	CRP Raised	CRP Normal	Total	χ2-value	p-value
Upto 10 yrs	3(3.85%)	1(4.55%)	4	4.66	0.45 NS,p>0.05
11-20 yrs	31(39.74%)	4(18.18%)	35		
21-30 yrs	27(34.62%)	10(45.45%)	37		
31-40 yrs	9(11.54%)	4(18.18%)	13		
41-50 yrs	6(7.69%)	3(13.64%)	9		
51-60 yrs	2(2.56%)	0(0%)	2		
Total	78(100%)	22(100%)	100		
Mean±SD	24.60±11.15	27.68±10	25.28±10.93		

www.ijbamr.com P ISSN: 2250-284X , E ISSN : 2250-2858

Graph : Age wise distribution of patients in appedicitis

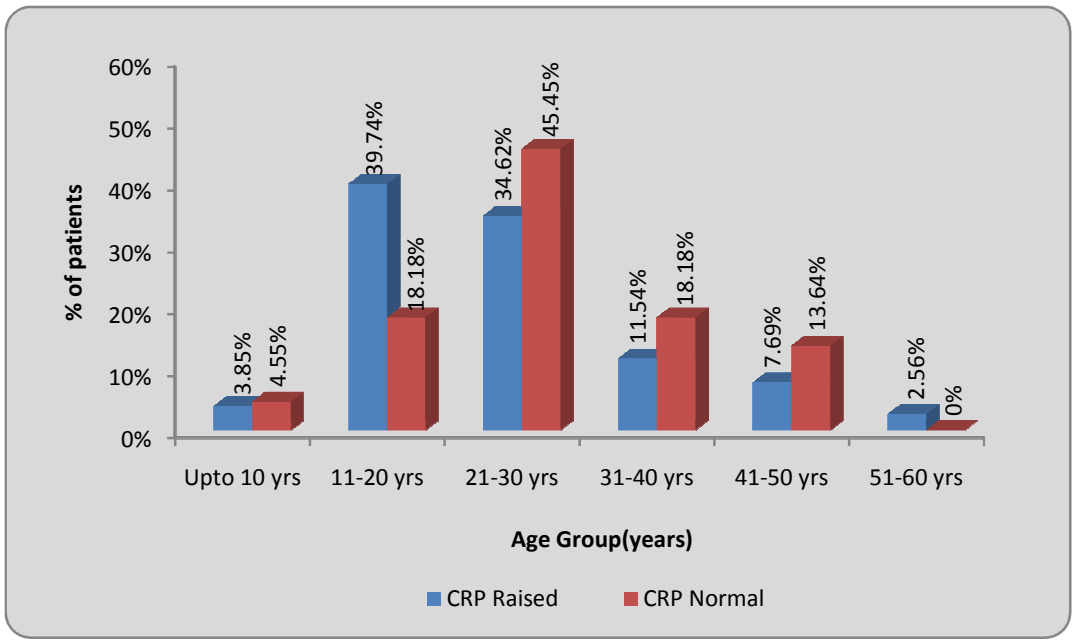
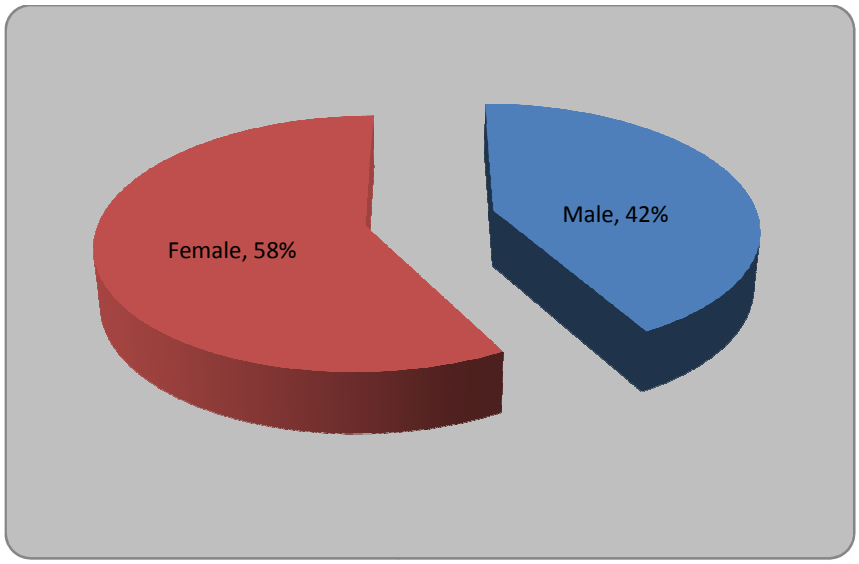


Table : Gender wise distribution of patients in appendicitis

Gender	No of patients	Percentage(%)
Male	42	42
Female	58	58
Total	100	100.0

Graph : Gender wise distribution of patients



www.ijbamr.com P ISSN: 2250-284X , E ISSN : 2250-2858

Table : Distribution of patients according to clinical signs

Clinical Signs	Yes		No	
	n	%	n	%
Migratory RIF pain	69	69	31	31
Nausea / Vomiting	59	59	41	41
Anorexia	63	63	37	37
Elevated Temperature	53	53	47	47

Graph: Distribution of patients according to clinical signs

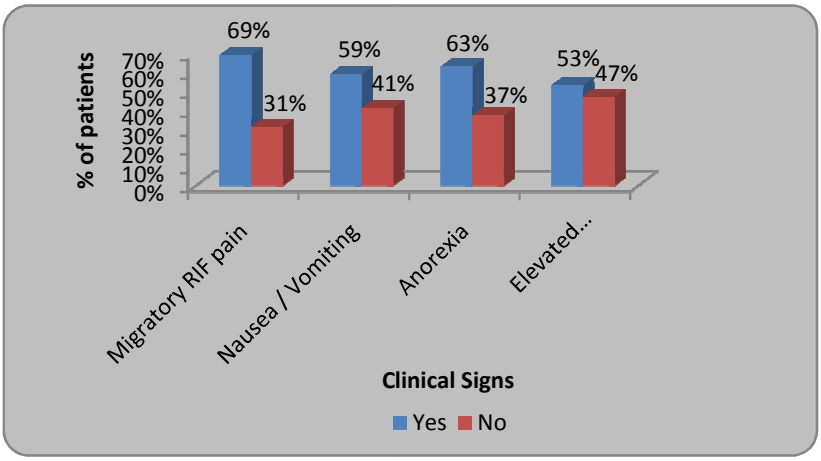


Table : Distribution of patients according to tenderness in RIF

Tenderness in RIF	No of patients	Percentage(%)
Yes	92	92
No	8	8
Total	100	100

Graph : Distribution of patients according to tenderness in RIF

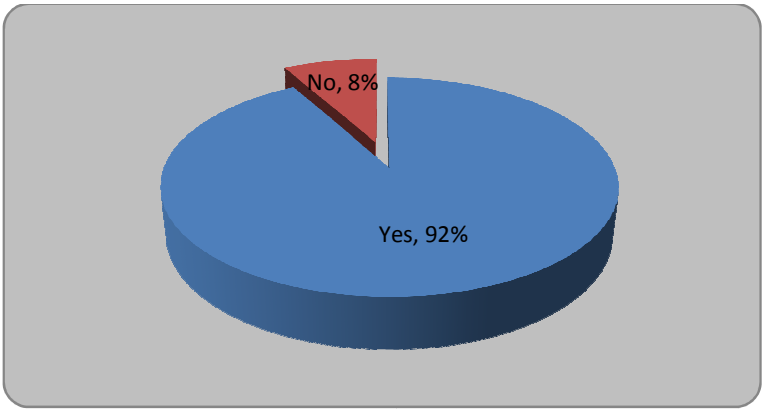
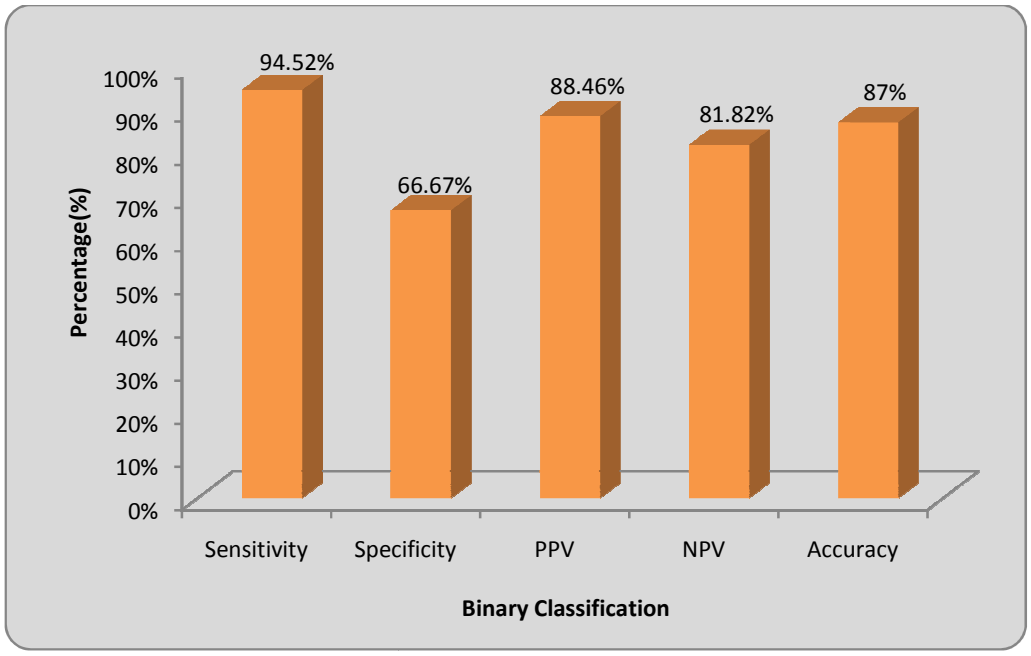


Table: Correlation between CRP and histopathological findings

		Histopathological Findings		Total	χ2-value
CRP Findings		Positive	Negative		
	Raised	69	9	78	43.00 p=0.0001,S
	Normal	4	18	22	
Total		73	27	100	

- Sensitivity =94.52%(86.56-98.49%)
- Specificity=66.67%(46.04-83.48%)
- Positive Predictive Value=88.46%(79.22-94.59%)
- Negative Predictive Value=81.82%(59.72-94.81%)
- Diagnostic Accuracy=87%
- Likelihood Ratio=2.836

Graph: Correlation between CRP and histopathological findings



Conclusion

We undertook this study to evaluate the utility of CRP as a diagnostic tool among patients clinically suspected to have acute appendicitis, at Jawaharlal Nehru Medical College, DMIMSU, Sawangi, Wardha.

According to our study, Ultrasonography shows Sensitivity =58.90%, Specificity=51.85%, Positive Predictive Value=76.79%, Negative Predictive Value=31.82% and Diagnostic Accuracy=57% . C-Reactive Protein in our study has a Sensitivity of 94.52%, Specificity of 66.67%, Positive Predictive Value is 88.46% and Negative Predictive Value is calculated to be 81.82%, The Diagnostic Accuracy is 87% in proving a diagnosis of appendicitis. C-Reactive Protein values when observed and correlated to the conformation by histopathology, we came to the conclusion that, clinical features are still the most reliable method to diagnose appendicitis.

Hence it cannot be used as a single investigation in diagnosing Appendicitis.

Bibliography:

1.Addiss DG, et al. The epidemiology of appendicitis and appendectomy in the United States. Am J Epidemiol. 1990;132(5):910–25.

2.Assefa Z, G/yesuse A Acute appendicitis in children admitted to zewditu memorial hospital. Ethiop Med J. 2014 Oct; 52(4):189-95.

3.Alvarado A A practical score for the early diagnosis of acute appendicitis , Ann Emerg Med. 1986 May; 15(5):557-64

4.Apak S, Kazez A, Ozel SK, Ustundag B, Akpolat N, Kizirgil A Spot urine 5-hydroxyindoleacetic acid levels in the early diagnosis of acute appendicitis.JPediatr Surg. 2005 Sep; 40(9):1436-9

5.Takeda M., Higashi Y., Shoji T., Hiraide T., Maruo H. Necrotizing fasciitis caused by a primary appendicocutaneous fistula. Surgery Today. 2012;42(8):781–784. doi: 10.1007/s00595-012-0140-x.[PMC free article] [PubMed] [Cross Ref]

6. García-Muñoz-Najar A., Carrión-Álvarez L., Medina-García M., García-González M. D., Pereira-Pérez F. Appendicovesical fistula treated with elective laparoscopic surgery. Cirugía y Cirujanos. 2013;81(4):344–347. [PubMed]

7. Kim J. S. Acute abdominal pain in children. Pediatric Gastroenterology, Hepatology & Nutrition.2013;16(4):219–224. doi: 10.5223/pghn.2013.16.4.219. [PMC free article]

8. Broushok KF, Jeffrey RB Jr, laing FC et al. Sonographic diagnosis of perforation in patients with acute appendicitis. AJR. 1990; 154: 275 – 8.

9.Noh H, Chang SJ, Han A The diagnostic values of preoperative laboratory markers in children with complicated appendicitis. J Korean Surg Soc. 2012 Oct; 83(4):237-41.

10. Sandstrom A, Grieve DA. Hyperbilirubinaemia: its utility in non-perforated appendicitis. ANZ J Surg.2015 [PubMed]

11. Adams HL, Jaunoo S. Hyperbilirubinaemia in appendicitis: the diagnostic value for prediction of appendicitis and appendiceal perforation. Eur J Trauma Emerg Surg. 2015 [PubMed]

12. Atema JJ, van Rossem CC, Leeuwenburgh MM, Stoker J, Boermeester MA. Scoring system to distinguish uncomplicated from complicated acute appendicitis. Br J Surg. 2015;102:979–90. doi: 10.1002/bjs.9835. [PubMed] [Cross Ref]