IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 8 Ser. 1 (August. 2019), PP 11-14
www.iosrjournals.org

Role of Immunohistochemical Markers in Diagnosis of Clinically Suspected Cases of Appendicitis and Its Correlation with Histopathology

Dr.Kamal Narayan Prasad[1] Dr. Ravi Shankar[2] Dr. Bejoy Chand Banerjee[3], Dr. Anil Kumar Sinha[3]

[1.]*Author- Junior Resident, Department of Pathology , Rajendra Institute of Medical Sciences,Ranchi*
[2.] *Co Author- Tutor, Department of Pathology ,Patliputra Medical college ,Dhanbad*
[3.]*Corresponding Author- Professor and Head of Department, Department of Pathology ,Patliputra Medical college ,Dhanbad*
[4.] *Professor, Department of Pathology ,Rajendra Institute of Medical Sciences,Ranchi*

Date of Submission: 20-07-2019 Date of acceptance: 05-08-2019

I. Introduction

The appendix is a normal true diverticulum of the cecum. Like any diverticulum, it is prone to acute and chronic inflammation, and acute appendicitis is a relatively common entity. Other lesions, including tumors, can also occur in the appendix but are far less common.(1)

Acute appendicitis is most common in adolescents and young adults but may occur in any age group. The lifetime risk for appendicitis is 7%; males are affected slightly more often than females. Despite the prevalence of acute appendicitis, the diagnosis can be difficult to confirm preoperatively, and the condition may be confused with mesenteric lymphadenitis (often secondary to unrecognized *Yersinia* infection or viral enterocolitis), acute salpingitis, ectopic pregnancy, mittelschmerz (pain associated with ovulation), and Meckel diverticulitis.(1)

The diagnosis of acute appendicitis being essentially clinical, the decision for operation alone leads to removal of normal appendix in 15-30 percent of cases. The premises that better to remove a normal appendix than to delay diagnosis does not standup to close scrutiny particularly in the elderly. Number of clinical and laboratory based scoring system have been devised to assist diagnosis. The most widely used is the Alvardo score, a score of 7or more strongly predictive of acute appendicitis.

Patients with clinical signs and symptoms of acute appendicitis,appendectomy relieves symptoms in vast majority of them. Acute appendicitis is one of the most frequent reasons for acute abdominal operation.(2)

In early acute appendicitis, subserosal vessels are congested, and a modest perivascular neutrophilic infiltrate is present within all layers of the wall. The inflammatory reaction transforms the normal glistening serosa into a dull, granular-appearing, erythematous surface. Although mucosal neutrophils and focal superficial ulceration often are present, these findings are not specific, and diagnosis of acute appendicitis requires neutrophilic infiltration of the *muscularis propria*. In more severe cases, focal abscesses may form within the wall **(acute suppurative appendicitis),** and these may even progress to large areas of hemorrhagic ulceration and gangrenous necrosis that extend to the serosa, creating **acute gangrenous appendicitis,** which often is followed by rupture and suppurative peritonitis.(1)

The incidence of histologically normal appendix ranges from 8-41 percent. When extensive sectioning is done on histologically normal specimens, it often happens that a focus of inflammation is found in only a few serial section .This condition is known as FOCAL APPENDICITIS-so called because the polymorphonuclear infilitration is confined to a single focus,while the remaining appendix is devoid of any polymorphonuclear cells.It is not clear that all cases of acute appendicitis arise from this focal inflammation; however such inflammatory foci may be the earliest recognisable manifestation of appendicitis in some so called negative appendectomies.

A substantial HNA exhibit increased expression of TNF-alpha and IL-2, messenger RNA's (sensitive markers of inflammation in appendicitis) in germinal centers, submucosa and the lamina propria. Therefore, appendicectomy is recommended in patients with clinically suspected acute appendicitis even when the appendix does not appear inflamed during exploration.

In a study conducted by Laszlo etal. they concluded that there exists a subgroup of appendicitis within so called HNA in which evidence of an inflammatory pathologic condition is only obvious at a molecular level which was done by staining TNFα , IL2, COX-1,2,PGE2.iNOS,MHC-ll antigens using IHC technique.
The present study aims to find out age and sex incidence in acute appendicitis cases and to correlate histopathological finding and immunohistochemical finding of suspected cases operated for acute appendicitis.

II. Materials And Methods

Study was conducted in Department of Pathology, Rajendra Institute of Medical Sciences, Ranchi and nearby hospitals.
. Cases were selected on grounds of clinical suspicion of appendicitis and on the basis of history or presenting with complaints of right iliac fossa pain and fever.
During the study period, 47 cases which were clinically diagnosed as appendicitis were operated in Surgery Department and its histopathology was done in Department of pathology, Rajendra Institute of Medical Sciences, Ranchi. Cases comprised of patients admitted or managed in RIMS and nearby hospitals.
Duration of study was from July 2013 to September 2014
Among these cases which were initially diagnosed by Hematoxylin and Eosin (H&E) stained tissue sections, 47 cases were taken and were studied by using immunohistochemistry using monoclonal antibody to TNFα and IL2 on two separate sections for each individual case.

III. Statistical Analysis

Sensitivity (also called the **true positive rate**, or the **recall rate** in some fields) measures the proportion of actual positives which are correctly identified as such and is complementary to the false negative rate.

Sensitivity relates to the test's ability to identify a condition correctly. Mathematically, this can be expressed as:

$$\text{Sensitivity} = \frac{\text{number of true positives}}{\text{Number of true positive+number of false negative}}$$

	Condition positive	Condition negative
Test positive	True positive	True negative
Test negative	False negative	False positive

Total number of cases=47
Total number of cases confirmed by histology=37, true positive
Total number of cases confirmed by IHC=41, true positive+ false negative, i.e, condition positive

Sensitivity of histopathology = 37/37+4=90.24%
Histological examination is 90.24% sensitive in diagnosis a suspected cases of acute appendicitis.

IV. Observations And Results

TNFα and IL2 were studied in total 47 samples of specimen of appendix in suspected cases of acute appendicitis during july 2013 to October 2014.

The table shows incidence among various age groups

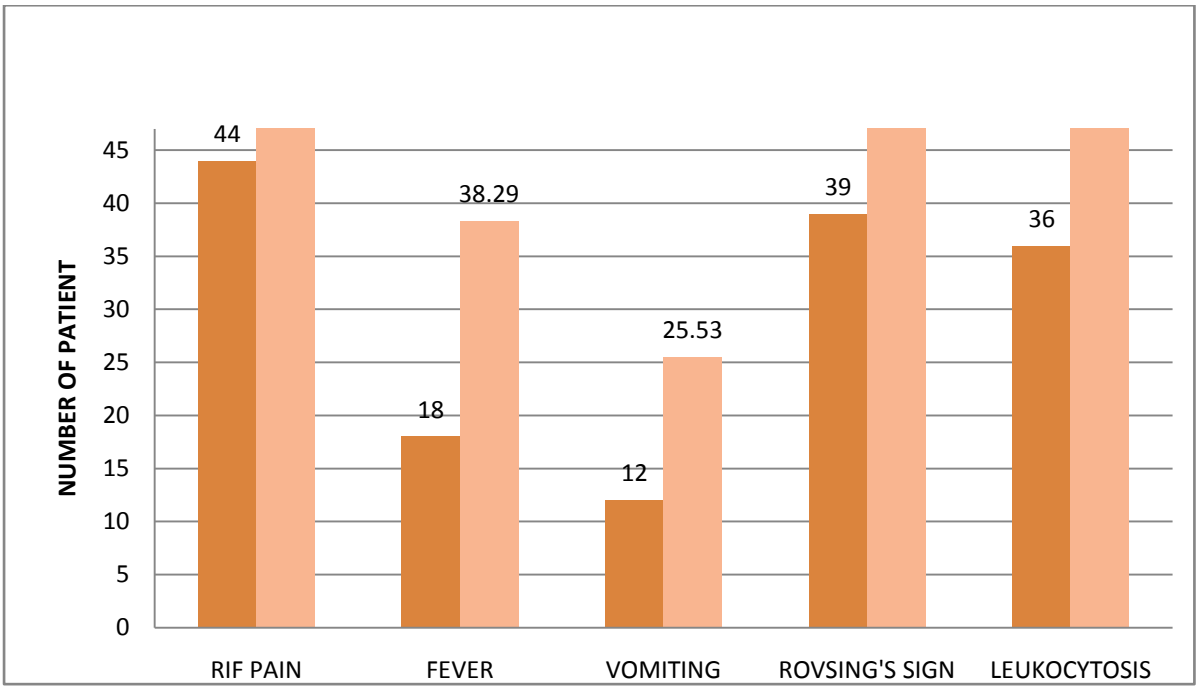
AGE	NUMBER OF PATIENT
0-9 yrs	**0**
10-19yrs	**22**
20-29yrs	**20**
30-39yrs	**3**
40-49yrs	**2**

Cases were between 0-49 yrs with a peak incidence in 10-19yrs age group.

The table shows incidence of clinical feature and laboratory finding in suspected cases of acute appendicitis

	RIF pain	Leukocytosis	Fever	vomiting	Rovsing's sign	total
Number of patients	**44**	**36**	**18**	**12**	**39**	**47**

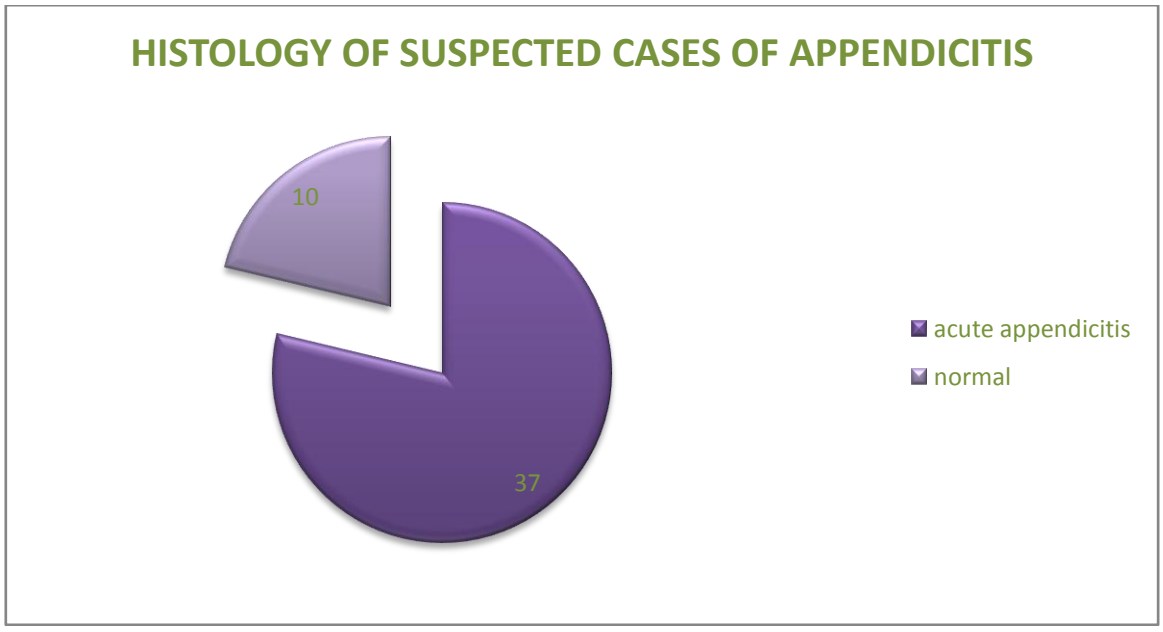
The study on 47 suspected cases of acute appendicitis shows 44 case have RIF pain, i.e 93.61% cases have RIF pain.



The table showing results of histological examination of suspected cases of acute appendicitis

suspected cases of acute appendicitis	**47**
Histological evidence of acute appendicitis	**37**
No evidence of acute appendicitis	**10**

Out of 47 clinically suspected cases of acute appendicitis only 37 cases showed histological evidence of acute appendicitis. i.e 78.72% cases of acute appendicitis showed histological evidence of acute appendicitis.
IL2 and TNFα IHC markers were studied among all the samples.



The table shows findings of IL2 and TNFα IHC markers in all suspected cases of acute appendicitis.

	Histological normal	***Acute appendicitis histologically***
IL2 positive	***4***	***35***
TNFα positive	***4***	***35***
IL2 negative	***6***	***2***
TNFα negaitive	***6***	***2***
Total		***47***

Total 47 suspected cases were studied ,out of which 37 cases were histologicaly confirmed cases and both IHC markers were studied it showed 35 cases to be positive for both IL2 and TNFα , i.e 94.59% confirmed cases show expression of inflammatory markers in their germinal centre and cytoplasm of inflammatory cells.10 histologically normal cases out of 47 suspected cases were also studied for inflammatory markers and 4 cases ,i.e 40% cases were found to have expression of *IL2 and TNFα* in their germinal centre of lymphoid follicle and cytoplasm of inflammatory cells.

V. Conclusion

10 histologically normal cases out of 47 suspected cases were also studied for inflammatory markers and 4 cases ,i.e 40% cases were found to have expression of *IL2 and TNFα* in their germinal centre of lymphoid follicle and cytoplasm of inflammatory cells. Appendix removed from patients with suspected appendicitis often appear normal on histological examination. We examined appendix specimens for expression of abnormal amounts of cytokines, an indicator of an inflammatory response and many cases which were histologically normal, showed presence of acute inflammation.

Bibliography

[1]. Robbins Basic Pathology, 9th Edition by Vinay Kumar, MBBS, MD, FRCPath, Abul K. Abbas, MBBS and Jon C. Aster, MD, PhD
[2]. Gough IR. A study of diagnostic accuracy in suspected acute appendicitis. Aust N Z J Surg 1988; 58: 555-9
[3]. Fitz RH: Perforating inflammation of the vermiform appendix with special refernce to its early diagnosis and treatment. Trans. Assoc. Am. Physicians 1:107, 1886.
[4]. Ellis H: Appendix in Schwartz SI(ed): Maingot's Abdominal operation, 8th edition, vol2, Norwalk Conn Appleton-Century-Crofts, 1985:p-1255
[5]. Mc Burney C: The incision made in the abdominal wall in cases of appendicitis.Ann surg 20:38, 1894.
[6]. Schwartz principle of surgery-nineth edition- the appendix- page 1076
[7]. Bailey and Love's short practice of surgery-25th edition-the vermiform appendix page 1204.
[8]. Wangensteen OH, Bowers WF (1937). "Significanceof the obstructive factor in the genesis of acute appendicitis". *Arch Surg* **34** (3): 496–526. doi:10.1001/archsurg.1937.01190090121006.
[9]. 9 Pieper R, Kager L, Tidefeldt U (1982). "Obstruction of appendix vermiformis causing acute appendicitis. One of the most common causes of this is an acute viral infection which causes lymphoid hyperplasia and therefore obstruction. An experimental study in the rabbit". *Acta Chir Scand* **148** (1): 63–72. PMID 7136413
[10]. editor-in-chief, F. Charles Brunicardi ; associate editors, Dana K. Andersen ... [et (2010). *Schwartz's principles of surgery* (9th ed. ed.). New York: McGraw-Hill, Medical Pub. Division. p. Chapter 30. ISBN 978-0-07-1547703. Retrieved 6 November 2014.
[11]. Hollerman J. et al. (1988). "Acute recurrent appendicitis with appendicolith". *Am J Emerg Med* **6** (6): 614–7.
[12]. Terasawa T, Blackmore CC, Bent S, Kohlwes RJ (October 2004). "Systematic review: computed tomography and ultrasonography to detect acute appendicitis in adults and adolescents". *Annals of Internal Medicine* **141** (7): 537–46.
[13]. CDEM Curriculum
[14]. "BestBets: The Alvarado Scoring System is an accurate diagnostic tool for appendicitis"
[15]. Butler C: Surgical pathology of acute appendicitis. *Hum Pathol* 1981; 12:870-878
[16]. Sisson RG, Ahlvin RC, Harlow MC: Superficial mucosal ulceration and the pathogenesis of acute appendicitis in childhood. Am J Surg 1971; 122:378-380.
[17]. Remington JH, McDonald JR: Vascular thrombosis in acute appendicitis. Surgery 1948; 24:787-792.
[18]. Tsuji M, Puri P, Reen DJ: Characterization of the local inflammatory response in appendicitis. J Pediatr Gastroenterol Nutr 1993; 16:43-48.
[19]. Thadepalli H, Mandal AK, Chuah SK, Lou MA: Bacteriology of the appendix and the ileum in health and in appendicitis. Am Surg 1991; 57:317-322.
[20]. Birch PJ, Richmond I, Bennett MK: Xanthogranulomatous appendicitis. Histopathology 1993; 22:597-598.
[21]. Carr NJ, Montgomery E: Patterns of healing in the appendix. The morphologic changes in resolving primary acute appendicitis and a comparison with Crohn's disease. Int J Surg Pathol 1994; 2:23-30.

Dr.Kamal Narayan Prasad" Role of Immunohistochemical Markers in Diagnosis of Clinically Suspected Cases of Appendicitis and Its Correlation with Histopathology." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 8, 2019, pp 11-14.