Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr ICV 2018= 82.06 UGC approved journal no. 63854

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Evaluation of correlation between ultrasonographic and surgical findings in acute appendicitis patients

[1]Sabujan Sainudeen, [2]Aswin Padmanabhan, [3]R C Krishna Kumar

[1]Associate Professor, [2]Assistant Professor, Department of Radiology, PK Das Institute of Medical Sciences, Palakkad, Kerala, India
[3]Medical Director, PK Das Institute of Medical Sciences, Palakkad, Kerala, India

ABSTRACT:
Aim: To assess correlation between ultrasonographic and surgical findings in acute appendicitis patients. **Methodology:** Seventy adult patients age ranged 18- 60 years of either gender presenting with acute appendicitis were planned to undergo ultrasonographic (USG) examination. **Results:** Common clinical features reported were fever in 15% patients, nausea/ vomiting in 74%, shift in pain in 27%, loss of appetite in 56%, RLQ tenderness in 72% and rebound tenderness in 48%. The difference was significant (P< 0.05). Position of appendix was pre- ileal in 6%, post- ileal in 6%, subhepatic in 3%, pelvic in 15%, retrocecal in 52% and subcecal in 8% patients. The difference was significant (P< 0.05). Sonographic diagnosis was positive in 65 and negative in 5 patients. The difference was significant (P< 0.05). **Conclusion:** Ultrasonography found to be effective in diagnosis of in acute appendicitis in addition to clinical findings.
Key words: Acute appendicitis, Ultrasonography, vomiting

Received: 15 April, 2019 Accepted: 18 May 2019

Corresponding author: Aswin Padmanabhan, Assistant Professor, Department of Radiology, PK Das Institute of Medical Sciences, Palakkad, Kerala, India

This article may be cited as: Sainudeen S, Padmanabhan A, Kumar RCK. Evaluation of correlation between ultrasonographic and surgical findings in acute appendicitis patients. J Adv Med Dent Scie Res 2019;7(6): 178-180.

INTRODUCTION

Acute appendicitis refers to acute inflammation of the vermiform appendix, which is a blind-ended tube arising from the cecum.[1] It is a vestigial organ but it can become diseased. Appendicitis is a surgical emergency, and if it is left untreated, the appendix may perforate and cause potentially fatal complications, especially in children and the elderly.[2]

Patients with acute appendicitis typically present with central abdominal pain shifting to the right lower quadrant or may present with generalized abdominal pain.[3] Vomiting is common in children. Clinical examination reveals signs of acute intra-abdominal process, local and rebound tenderness, muscle guarding, rigidity, cutaneous hyperesthesia, and tenderness on rectal examination.[4]

The use of ultrasound as a diagnostic tool in patients with acute appendicitis has been well studied.[5] Ultrasonographic criteria of acute appendicitis include blind-ended, non-compressible, aperistaltic tube, with diameter more than 6 mm, arising from the tip of cecum with a gut signature.[6] Visualization of an appendix with an appendicolith, regardless of appendiceal diameter, is also regarded as a positive test. However, a normal appendix can also be visible on ultrasound.[7]Considering this, we performed present study to assess correlation between ultrasonographic and surgical findings in acute appendicitis patients.

METHODOLOGY

The present prospective, observational study comprised of seventy adult patients age ranged 18- 60 years of either gender presenting with acute appendicitis were recruited. Ethical review committee of the institute gave permission to conduct this study. A valid written consent in vernacular language was obtained from selected patients.

Demographic data was recorded in case history performa. Parameters such as complaints, duration, severity, sequence of onset of symptoms, mode of

onset, progression, change in pattern at the time of presentationetc. was recorded. All patients were planned to undergo Ultrasonographic (USG) examination which was performed with a handheld 3.5 MHZ sector probe and with a 5 MHZ sector probe scan of the right lateral quadrant (RLQ) using graded compression technique. The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

RESULTS

Table I: Gender wise distribution of patients

Total- 70		
Gender	**Male**	**Female**
Number	40 (57.1%)	30 (42.9%)

Out of 70 patients, males comprise 40 (57.1%) and females 30 (42.9%)(Table I).

Table II: Evaluation of clinical features

Clinical features	Percentage	P value
Fever	15%	0.04
Nausea/ vomiting	74%	
Shift in pain	27%	
Loss of appetite	56%	
RLQ tenderness	72%	
Rebound tenderness	48%	

Common clinical features reported were fever in 15% patients, nausea/ vomiting in 74%, shift in pain in 27%, loss of appetite in 56%, RLQ tenderness in 72% and rebound tenderness in 48%. The difference was significant (P< 0.05) (Table II).

Table III: Evaluation ofposition of appendix

Position of appendix	Percentage	P value
Pre- ileal	6%	0.01
Post- ileal	6%	
Subhepatic	3%	
Pelvic	15%	
Retrocecal	52%	
Subcecal	8%	

Position of appendix was pre- ileal in 6%, post- ileal in 6%, subhepatic in 3%, pelvic in 15%, retrocecal in 52% and subcecal in 8% patients. The difference was significant (P< 0.05) (Table III).

Table IV: Evaluation of sonographic diagnosis

Sonographic diagnosis	Number	P value
Positive	65	0.01
Negative	5	

Sonographic diagnosis was positive in 65 and negative in 5patients. The difference was significant (P< 0.05) (Table IV).

DISCUSSION

Acute abdominal pain remains a challenge to surgeons and physicians.[8] One of the most frequent causes of surgical emergencies and abdominal pain is acute appendicitis.[9] Patients with appendicitis present with a wide variety of clinical manifestations, which may mimic symptoms of other diseases. The classic presentation of a patient with appendicitis has a typical sequence of symptoms.[10]It occurs in only 50–60% of patients, and the diagnosis may be missed or delayed when atypical patterns of disease are encountered.[11] About one third of patients with acute appendicitis present with atypical symptoms.[12,13]It is noted that young women commonly present with acute gynecological illnesses that closely mimic acute appendicitis. Appendicitis is a surgical emergency, and if it is left untreated, the appendix may perforate and cause potentially fatal complications, especially in children and the elderly.[14,15]The present study assessed correlation between ultrasonographic and surgical findings in acute appendicitis patients.

Our study showed that out of 70 patients, males were 40 and females were 30. Ashjaei et al[16] in their study one hundred and eight children suspected of acute appendicitis were enrolled. Patients presenting as acute abdomen suspected as having acute appendicitis underwent abdominal ultrasonography (US). The analysis of sonographic results showed that 67.6% of patients had acute appendicitis, 13.9% had perforated appendicitis and 18.5% had normal appendix. On the other hand, there were acute appendicitis in 63.9% of patients, perforated appendicitis in 12% and normal appendix in 8.3% in surgical reports. Sensitivity of uncompressible appendicitis, appendicitis, maximal outer diameter (MOD) above 6 mm, maximal mural thickness (MMT) above 3 mm, round appendix was 98.68%, 28.04%, 94.74%, 61.84% and 68.42%, respectively. Specificity of incompressible appendicitis, appendicitis, MOD above 6 mm, MMT above 3 mm, round appendix was 64.71%, 96.15%, 64.71%, 82.35% and 94.12%, respectively. Overall sensitivity and specificity of US in appendicitis were 97.56% and 69.23%, respectively.

We observed that common clinical features reported were fever in 15% patients, nausea/ vomiting in 74%, shift in pain in 27%, loss of appetite in 56%, RLQ tenderness in 72% and rebound tenderness in 48%. Puylaert et al[17] studied abdominal ultrasonography in 111 patients thought to have appendicitis. It was found that among 52 patients later shown in surgery to have appendicitis, ultrasonography was unequivocally positive in 39 (sensitivity, 75 percent). Of 31 patients in whom appendicitis was definitely excluded, none had a positive ultrasound examination (specificity, 100 percent). The sensitivity in those with a perforated appendix (28.5 percent) was much lower than in those with acute non-perforating appendicitis (80.5 percent) or appendiceal mass (89 percent), but the low sensitivity did not influence clinical management, since the need for surgery in patients with a perforated appendix was clinically obvious. Ultrasonography resulted in changes in the proposed management in 29 of the 111 patients (26 percent).

Our study revealed that position of appendix was pre-ileal in 6%, post- ileal in 6%, subhepatic in 3%, pelvic in 15%, retrocecal in 52% and subcecal in 8% patients. Ali et al[18]found thatout of 60 total cases, 48 cases were acute appendicitis histopathologically, out of them, 39 (81.25%) were male and 09 (18.75%) were female. An increased leukocyte count was found in 65% of cases of histopathologically diagnosed acute appendicitis. Self-localization was found to be useful in diagnosis by ultrasound. About 80% (48 cases) showed ultrasound findings suggestive of acute appendicitis.

Our study showed that sonographic diagnosis was positive in 65 and negative in 5 patients. Franke et al[19]assessed the performance and clinical benefit of ultrasonography of the appendixin 870 (38%) patients. The overall sensitivity of ultrasonography of the appendix was 55%, the specificity 95%, positive predictive value 81% and negative predictive value 85%. There were no correlations between the ultrasound findings of the appendix and the diagnostic accuracy of the clinician, the negative appendectomy rate, or the perforated appendix rate.

CONCLUSION

Ultrasonographyfound to be effective in diagnosis of in acute appendicitis in addition to clinical findings.

REFERENCES

1. Patra RK, Gupta DO, Patil RR. Clinicopathological and ultrasonographic correlation of acute appendicitis in emergency: A prospective and retrospective study. Arch Int Surg2014;4:11-4.
2. Fenyo G. Acute abdominal disease in the elderly: Experience from two series in Stockholm. Am J Surg1982;143:751-4.
3. Balsano N, Cayten CG. Surgical emergencies of the abdomen. Emerg Med Clin North Am 1990;8:399-410.
4. Ngodngamthaweesuk N, Tunthangtham A, Sakonya D. Acute appendicitis: A 5-year review of histopathology and clinical presentation. Thai J Surg2003;24:81-4.
5. Burns RP, Joseph LC, William LR, Bard RM. Appendicitis in mature patients. Ann Surg1995;201:695-704.
6. Yegane P, Peyvandi H, Hajinasrollah E, Salehei N, Ahmadei M. Evaluation of the Modified Alvarado Score in Acute Appendicitis among Iranian patients. Acta Medica Iranica2008;46:501-6.
7. Deutch AA, Shani N, Reiss R. Are some appendicectomies unnecessary? An analysis of 319 white appendices. J R Coll Surg Edin 1983;28:35-40.
8. Addiss DG, Shaffer N, Fowler BS. The epidemiology of appendicitis and appendectomy in the United States. Am J Epidemiol1990;132:910-25.
9. Joshi HM, Patel VB, Dave AN. Ultrasonographic evaluation of acute appendicitis. Indian J Radiol Imaging 1996;6:75-8.
10. Brown JJ. Acute appendicitis: The radiologist's role. Radiology 1991;180:13-4.
11. Jess P, Bjerregaard B, Brynitz S, Holst-Christensen J, Kalaja E, Lund Kristensen J. Acute appendicitis. Prospective trial concerning diagnostic accuracy and complications. Am J Surg1981;141:232-4.
12. Sigdel GS, Lakhey PJ, Mishra PR. Tzanakis score vs. Alvarado score in acute appendicitis. JNMA J Nepal Med Assoc 2010;49:96-9.
13. Zulfikar I, Khanzada TW, Sushel C, Samad A. Review of the pathologic diagnoses of appendectomy specimens Annals 2009;15:168-70.
14. Abu-Yousef MM, Bleicher JJ, Maher JW, Urdaneta LF, Franken EA Jr, Metcalf AM. High resolution sonography of acute appendicitis. AJR Am J Roentgenol1987;149:53-8.
15. Incesu L, Coskun A, Selcuk MB, Akan H, Sozubir S, Bernay F. Acute appendicitis: MR imaging and sonographic correlation. AJR. American journal of roentgenology. 1997 Mar;168(3):669-74.
16. Ashjaei B, Mehdizadeh M, Alizadeh H, Najm N, Moghtaderi M. Evaluating the value of different sonographic findings in diagnosis of acute appendicitis in children. African Journal of Paediatric Surgery: AJPS. 2022 Jan;19(1):13.
17. Puylaert JB, Rutgers PH, Lisang RI, de Vries BC, van der Werf SD, Dörr JP, et al. A prospective study of ultrasonography in the diagnosing of appendicits. N Engl J Med 1987;317:666-9.
18. Ali VAMM, Saravanan KK. Study on Correlation between Ultrasonographic and Surgical Findings in Acute Appendicitis. Int J Sci Stud 2021;9(2):80-83.
19. Franke C, Böhner H, Yang Q, Ohmann C, Röher HD. Ultrasonography for diagnosis of acute appendicitis: results of a prospective multicenter trial. World journal of surgery. 1999 Feb 1;23(2):141.