



Anorexia in acute appendicitis: A non-specific factor with significant accuracy in diagnosis

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General Note



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ABSTRACT

Background: Acute appendicitis is a common disease. Early diagnosis and treatment may decrease the associated morbidity and mortality associated with it. The availability of advanced imaging techniques such as computed tomography may not be available in a resource limited setting and thus patient's history and clinical symptoms are crucial in diagnosing appendicitis in its acute stage.

Most of the patients have anorexia as a symptom and the lack of it reduces the chances of having appendicitis. *Objective:* To determine the outcome of anorexia in patients of appendicitis with reference to its sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy. *Methods:* The patients clinically presenting as acute appendicitis and undergoing operative intervention were recruited in the study. History of anorexia was recorded in all the patients. The presence and absence of anorexia were evaluated and compared with the histopathology of the appendix. Parameters of diagnostic accuracy were measured. *Results:* The diagnostic accuracy of anorexia in our present study was found to be 91.25%. It had high sensitivity and PPV of 95.31% and 93.85%. The specificity and NPV of anorexia was found to be 75% and 80%. *Conclusion:* Anorexia is an important symptom which increases the probability of acute appendicitis.

Keywords: Modified Alvarado score, loss of appetite, negative appendicectomy

1. BACKGROUND

Acute appendicitis (AA) is a widespread disease requiring emergency care. AA may progress rapidly if not treated early. The complications of appendicitis such as perforation peritonitis are common in the extremes of age group. Diagnosis of acute appendicitis still remains in dilemma due to its atypical presentation in the females of reproductive age group, in children, in elderly and in pregnant women. The incidence of negative laprotomy is still in the range of 15 to 30% which leads to increase in morbidity of patients with loss of manpower and useful resources in rural setup which is already deprived of essential services (Salari & Binesh, 2007).

The absence of advanced imaging techniques such as computed tomography and procedures such as diagnostic laparoscopy in a rural setup is a major drawback. Thus the surgeon has to rely on clinical signs and symptoms for the diagnosis of acute appendicitis in a resource limited setting. Clinical assessment and history of specific symptoms such as anorexia have an important role in the diagnosis of acute appendicitis along with right lower quadrant pain and nausea or vomiting (Salari & Binesh, 2007). Thus this study is undertaken to know the significance of anorexia with reference to its sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and diagnostic accuracy in patients of acute appendicitis.

2. METHODS

The present study was undertaken in a rural hospital in central India. This study was a prospective observational study. The study period was from June 2019 to November 2019. Around 80 patients were enrolled in the study.

Inclusion criteria

All patients with a diagnosis of acute appendicitis on clinical examination and willing for operative intervention were included in the study.

Exclusion criteria

Pregnant women (pregnancy induced vomiting is very common and this leads to anorexia which decreases its sensitivity)
Appendicular mass or abscess
Ureteric calculi

The study was done after the approval from the ethics committee of Datta Meghe Institute of Medical Sciences University. The data collected included the presenting complaints, clinical signs, laboratory investigations (WBC counts >10,000/mm³) and ultrasonography. While taking history of anorexia, the patients were enquired about their wish to have food that they enjoy eating. All the patients underwent open appendicectomy and the sample was sent to histopathological examination. Patient was operated based on clinical judgement and decision was taken by the consultant surgeon. Statistical calculations were done using the SPSS 24.0 version and the results were then presented.

3. RESULTS

Around 80 patients were included in this prospective study. There were 50 male and 30 female patients. The age group of 15 to 30 years had most number of patients (46%). Out of 80 patients, 65 (81.25%) patients had anorexia. Out of the 65 patients, 61 patients had appendicitis on histopathological examination whereas the remaining 4 patients with anorexia had normal appendix on

histopathology. Out of the remaining 15 patients who did not have anorexia, there were 12 patients with normal appendix on histopathology and 3 patients with appendicitis on histopathology (table 1).

The sensitivity and specificity of anorexia was 95.31% and 75% respectively. The PPV and NPV were 93.85% and 80% respectively. The diagnostic accuracy of anorexia in our present study was found to be 91.25% (figure 1).

Table 1 Distribution of anorexia in patients according to appendicitis on histopathology

Anorexia	Yes		No		Total
	N	%	N	%	
Appendicitis					
Yes	61	95.31	03	4.68	64
No	04	25	12	75	16
Total	65	81.25	15	18.75	80

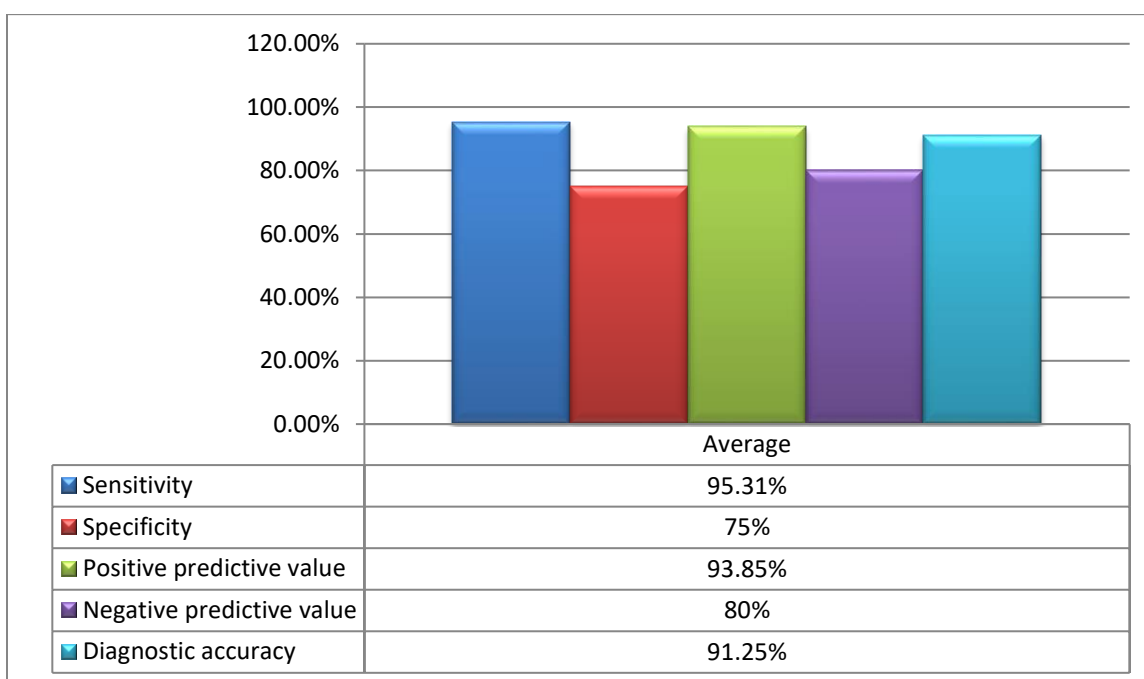


Figure 1 Final result of Anorexia with respect to its Sensitivity, Specificity, Positive predictive value, Negative predictive value and Diagnostic accuracy

4. DISCUSSION

AA has diverse clinical symptoms such as migration of pain to right lower quadrant, anorexia, nausea or vomiting, constipation and urinary symptoms. Anorexia is a cardinal and a frequent feature of appendicitis. The diagnosis of acute appendicitis should be reconsidered in a patient presenting with abdominal pain without anorexia. In this study, anorexia was present in 81.25% of patients, thus it is a dominant symptom in this disease (Pisarra, 1999).

The appearance of symptoms in approximately 95% of patients with AA typically begins with anorexia followed by abdominal pain and then vomiting but this is not true for pregnant patients with acute appendicitis (Hardin, 1999). In pregnant women with appendicitis, the only significant symptoms are of nausea, vomiting and local peritonitis (Brown et al., 2009). William NM et al stated that peri-umbilical pain radiating to right iliac fossa was inadequate to differentiate appendicitis from vague abdominal pain (William et al., 1998). Rasmussen and Hoffmann observed that if anorexia, nausea and vomiting were absent from the clinical history of the patient then the diagnosis of appendicitis should be reviewed (Rasmussen & Hoffmann, 1991). Horattas MC and her colleagues showed that appendicitis in the older age group was linked with higher morbidity and mortality. She reported that 20% cases in her study had anorexia, fever; right iliac fossa pain and raised leukocyte count (Horattas et al., 1990). Faloon WF et al. in his study found that anorexia was present in more than 95% of patients (Fallon et al., 1995). Lamture YR et al. reported that anorexia expands the

likelihood of having an inflamed appendix yet its nonappearance cannot preclude the diagnosis of acute appendicitis as specificity and NPV are less. In his study he reported that anorexia had sensitivity and PPV of 80% and 95.12% whereas specificity and NPV were 42.86% and 13.33% respectively. The diagnostic accuracy of anorexia reported by him was 77.51%. Thus he included anorexia as a parameter in his newly made scoring system called Yash scoring system and gave a score of one out of 15 (Lamtüre et al., 2017).

Anorexia as a parameter is also included in modified Alvarado and RIPASA scoring systems which highlights its importance in identifying cases of acute appendicitis (Lamtüre et al., 2017). The limitation of this parameter is that its absence cannot rule out appendicitis especially in elderly and pregnant women where the presentation is atypical.

5. CONCLUSION

Anorexia has a significant role in diagnosing acute appendicitis. It increases the likelihood of having appendicitis but its absence cannot rule out the same. Thus it is a valuable parameter in diagnosing acute appendicitis in a resource limited setting.

Abbreviations

AA:	Acute appendicitis
PPV:	Positive predictive value
NPV:	Negative predictive value
DA:	Diagnostic accuracy
WBC:	White blood cell

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This research received no external funding.

Conflict of interest

The authors declare that they have no conflict of interest.

Informed consent

Written and Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval for human

All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards (Institutional Ethics Committee Registration number: ECR/440/Inst/MH/2013/RR-2016).

Ethical approval

The study was approved by the Medical Ethics Committee of Datta Meghe Institute of Medical Sciences, Deemed University (Ethical approval Ref.No. DMIMS (DU)/IEC/2018-19/7426).

Data and materials availability

All data associated with this study are present in the paper.

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