



A Comparison Of Tzanakis Score Vs Alvarado Score In The Effective Diagnosis Of Acute Appendicitis – A Retrospective Study

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Abstract

Overview of the Background

Globally, the most common surgical emergency that arises is acute appendicitis.

The purpose of this study was to evaluate the diagnostic accuracy of the Alvarado and Tzanakis scores for acute appendicitis.

Goals

The purpose of this study is to evaluate the diagnostic accuracy of the Alvarado and Tzanakis scoring systems for AA and to check which scoring system is superior.

Techniques

This study was carried out in the Chettinad Hospital and was retrospective and non-randomized observational in nature. It comprised 200 cases of acute appendicitis with a clinical diagnosis that underwent laparoscopic or open emergency appendectomy from November 2022 – November 2023. The pathologist's final diagnosis of acute appendicitis was based on histological results.

Outcomes

Tzanakis score results were 86.9%, 75.0, 97.5%, and 33.3% for sensitivity, specificity, positive predictive value, and negative predictive value, respectively. The Alvarado score had the following values: 76.0%, 75.0%, 97.2%, and 21.4% for sensitivity, specificity, positive predictive value, and negative predictive value, respectively. 8.0% of appendices were negative.

Summary

The Tzanakis scoring system is a useful tool for identifying cases of acute appendicitis.

Keywords: Tzanakis score, Alvarado score, and acute appendicitis

Introduction

Globally, appendicitis is the most frequent abdominal emergency. The lifetime risk of acute appendicitis (AA) is 6.7% for women and 8.6% for males. Only 70–87 percent of cases can be successfully diagnosed with AA using clinical examination. A lot of people utilize the Alvarado scoring system to diagnose AA. It is comprised of indications, symptoms, and

markers of inflammation. A score of seven or higher on a ten-point scale indicates AA status, necessitating immediate surgical intervention^[1]. It has a range of 70–90% for sensitivity and 87-92% for specificity.

The Tzanakis scoring method combines inflammatory indicators, ultrasonography, and

clinical examination A score of eight or above out of fifteen is regarded as AA, necessitating surgical intervention. It has accuracy, sensitivity, and specificity of 95.4%, 97.4%, and 96.5%, in that order. The purpose of this research is to evaluate how well the Alvarado and Tzanakis scoring systems diagnose AA^[2].

Aim

A Comparison of Tzanakis Score vs Alvarado Score in the Effective Diagnosis of Acute Appendicitis.

Methodology

The Chettinad Hospital and Research Institute hosted this retrospective, non-randomized observational study from November 2022 to November 2023. Following ethical permission from Chettinad Hospital and Research Institute’s institutional review committee, a total of 200 cases were studied. The study included every patient who had an open or laparoscopic appendectomy and had a clinical diagnosis of AA. All of the emergency and inpatient records of individuals with a clinical diagnosis of AA were examined as part of the study.

The study did not include patients diagnosed with appendicular abscess, appendicular bulge, or

appendicular perforation. The study did not include any patients who had been prescribed analgesics or sedatives before to receiving a clinical diagnosis of AA. Additionally noted were the Tzanakis and Alvarado scores that were seen at the time of admission. The pathologist's final diagnosis of AA was based on histology results.

Results

The Tzanakis scoring system and the Alvarado scoring system were compared using their respective cutoff scores of 813 and 710 for the former and the latter, respectively. Out of 200 patients who had their appendices removed, 160 were determined to be true positives based on the Tzanakis scoring system; this finding was corroborated by a histological examination (Table 1). In a similar way, 4 patients with scores of 8 or higher were misclassified as positive. Additionally, it was discovered that 24 out of the 36 patients with a score of less than 8 were false negatives (Table 1). In order to diagnose AA, the Tzanakis scoring system had a sensitivity of 86.95% and a specificity of 75%. It was discovered to have a negative predictive value of 33.33% and a positive predictive value of 97.5%.

Table 1

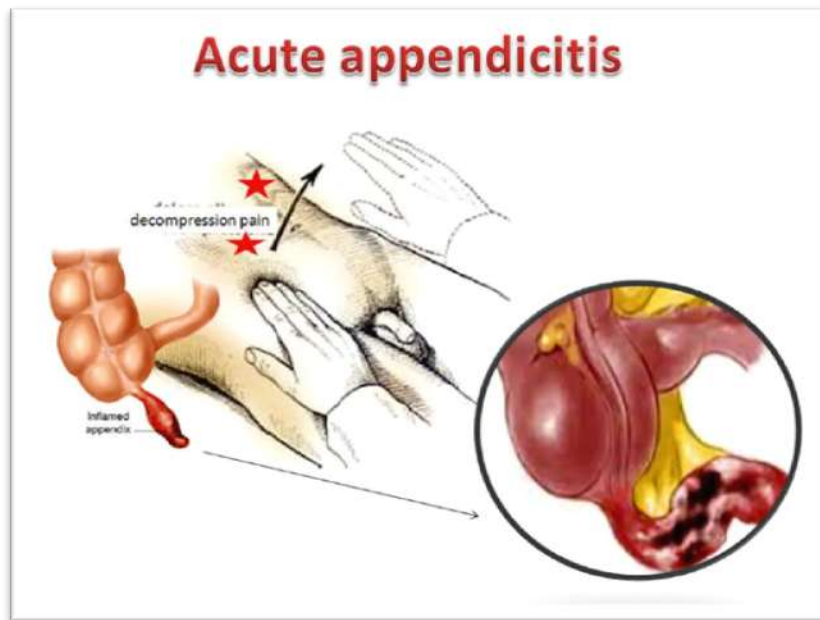
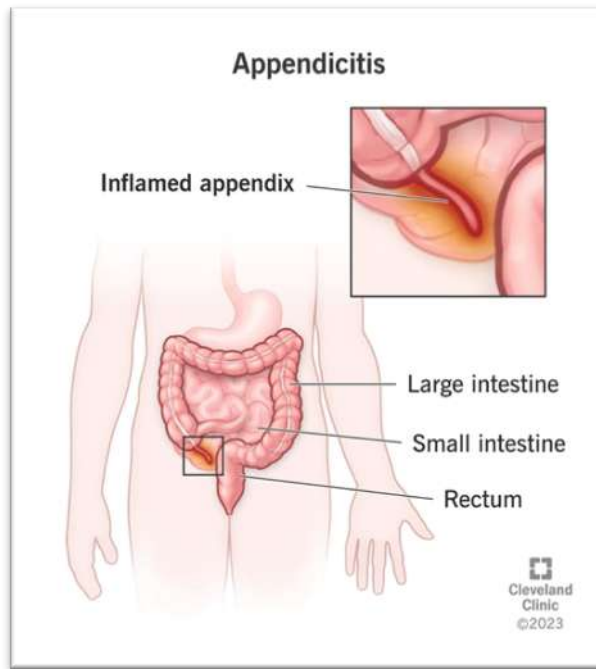
TZANAKIS SCORE	ACUTE APPENDICITIS	NORMAL APPENDIX	TOTAL PATIENTS
>=8	156	6	160
<8	28	10	40
Total Patients	184	16	200

Out of 200 patients who had appendices removed, 140 patients had true positive cases, as determined by a histological examination, based on the Alvarado scoring system (Table 2). In a similar vein, four patients with scores of seven or higher were misclassified as positive. Furthermore, out of the 56 patients who had a score lower than seven, 12 cases had a true negative result (Table 2). In terms of diagnosing AA, the Alvarado scoring system's sensitivity and specificity were 76% and 75%, respectively. It had a negative predictive value of 21.42% and a positive predictive value of 97.2 %.

Table 2

ALVARADO SCORE	ACUTE APPENDICITIS	NORMAL APPENDIX	TOTAL PATIENTS
>=7	138	5	142

<7	46	11	58
Total Patients	184	16	200



Discussion

The most frequent surgical emergency is AA, and diagnosing AA is never easy for a surgeon. Various scoring systems, such as RIPASA, Alvarado, Ohman, and Tzanakis, are designed to assist surgeons in making decisions in cases that are uncertain.

According to Tzanakis et al., the scoring system's sensitivity and specificity were 95.4% and 97.4%, correspondingly. According to our research, the Tzanakis scoring system's sensitivity was 86.5%, which is in line with Tzanakis et al[3-5]. In our investigation, the Tzanakis scoring system's

specificity was lower than the results published by Tzanakis et al.

The low sensitivity rate of ultrasonography (USG), with a sensitivity rate of 68%, may be the cause of the low specificity of the Tzanakis score in our investigation. When compared to other studies that reported sensitivity rates ranging from 85 to 96%, it is relatively low^[10-12]. The discrepancy may have resulted from the ultrasonologists' varying degrees of experience during this procedure. Thus, it is impossible to prevent individual disparity. In various studies, the Alvarado score demonstrated a sensitivity of 73-91% and a specificity of 78-92%^[6-9]. In the current study, the Alvarado Score's 76% sensitivity and 75% specificity are comparable.

The purpose of this study is to compare the Tzanakis and Alvarado scores' diagnostic accuracy for AA. It was discovered that the Tzanakis score had a higher sensitivity and negative predictive value. It was discovered that the specificity of the Alvarado and Tzanakis scores was identical. However, if the USG is performed by an experienced ultrasonologist, the specificity of the Tzanakis score can be increased by raising the sensitivity rate of the USG.

Conclusions

This study is to compare the Tzanakis and Alvarado scores' diagnostic accuracy for AA. It was discovered that the Tzanakis score had a higher sensitivity and negative predictive value. It was discovered that the specificity of the Alvarado and Tzanakis scores was identical. However, if the USG is performed by an experienced ultrasonologist, the specificity of the Tzanakis score can be increased by raising the sensitivity rate of the USG.

References

1. Baker MS, Wille M, Goldman H, Kim HK. Metastatic Kaposi Sarcoma presenting as acute appendicitis. *Mil Med.*1986;151:45-47.
2. Ohene-Yeboah M. Acute Surgical Admissions for abdominal Pains in adult in Kumasi, Ghana. *ANZ Surg.* 2006;76:898-903.
3. Lui CD, Mcfadden DW, Acute abdomen and appendix. *Surgery:Scientific principles and Practice.* Edited by : Greenfield LJ, Mulholand MW, Zelenock GB, Oldham KT, Lillemoe KD. Philadelphia: Lippencott-Raven;1997.pg 1246-1261.
4. Al-Omar M, Mamdam M, Mcleod RS: Epidemiolocal features of acute appendicitis in Ontario, Canada. *Can J Surg.* 2003, 46:263-268.
5. Flum DR, Koepsell T. The clinical and economic correlates of misdiagnosed appendicitis. *Arxh Surg.* 2002;37:799-804.
6. Rothrock SG, Pagane J. Acuet appendicitis in children: emergency department diagnosis and management. *Ann Emerg Med.* "006;6:39- 51.
7. Shelton T, Mckinlay R, Schwartz RW. Acute appendicitis : current diagnosis and treatment. *Curr Surge.* 2003;60:502-505.
8. John H, Neff U, Kelemen M. Appendicitis diagnosis today:clinical and ultrasound deduction. *World J Surg.* 1993;17:243-9.
9. Saidi RF, Ghasemi M Role of Alvarado score in diagnosis and treatment of suspected acute appendicitis. *Am J Emerg Med.* 2000;18:230-1.
10. Fenyo G, Lindenberg G, Blind P, Enchsson L, Oberg A. diagnostic decision support in suspected acute appendicitis. validation of simplified scoring system. 1997;163(11):831-8.
10. Fenyo G. Routine use of scoring system for decision making in suspected acute appendicitis in adukt. *Acta Chir Scand.* 1987; 153:545-1.
11. MCox MR, Mc call JL, Padbury RT, Wilson TG, Wattchow DA, Toouli J. Laparoscopic surgery in women with clinical diagnosis of acute appendicitis. *Med J Aust.* 1995;162:130.
12. Tzanikis NE, Efstathiou SP, Danulidis K, Rallis GE, Tsioulos GI, chatzivasiliou A et.al. A new approach to accurate diagnosis of acute appendicitis. *World J Surg.* 2005;29:1151-6.