



## A COMPARATIVE STUDY OF EFFICACY OF TZANAKIS SCORE WITH ALVARADO SCORE IN DIAGNOSING ACUTE APPENDICITIS

### Surgery

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### ABSTRACT

**BACKGROUND:** Acute Appendicitis is the most frequent surgical emergency encountered worldwide. This study was conducted to compare the efficacy of Tzanakis scoring and Alvarado scoring in diagnosing acute appendicitis.

**OBJECTIVES:** The aim of this study is to compare the efficacy of Tzanakis score system and Alvarado scoring system in diagnosing Acute Appendicitis.

**Methods:** This was a prospective and non randomized observational study conducted in Government Dharmapuri Medical college Hospital during 2015-2016. It includes 400 clinically diagnosed cases of Acute Appendicitis who underwent emergency open or Lap Appendicectomy . Final diagnosis was based on histological findings given by Pathologist.

**Results:** The sensitivity, Specifity, positive Predictive value and Negative Predictive value of Tzanakis score was 86.9%,75%, 97.5% and 33.3% respectively. The sensitivity, Specifity, positive Predictive value and Negative Predictive value of Alvarado score was 76%, 75%, 97.2% and 21.4% respectively. Negative Appendicectomy was 8.0%

**Conclusion:** Tzanakis scoring system is an effective scoring system in diagnosing acute appendicitis.

### KEYWORDS:

Acute Appendicitis, Alvarado score, Tzanakis score.

### INTRODUCTION:

Appendicitis is the most common abdominal emergency worldwide.<sup>1-4</sup> Lifetime risk of Acute Appendicitis(AA) is 8.6% and 6.7% for man and women respectively.<sup>5,7</sup> Clinical examination is helpful in diagnosis of AA in only 70-87% of the cases.<sup>8,9</sup>

Alvarado scoring system is widely used to diagnosis AA.<sup>10</sup> It consists of symptoms, signs and inflammatory markers. Out of 10 scores , a score of 7 or more is considered AA requiring emergency surgical treatment.<sup>10</sup> Its sensitivity and specificity ranges from 70-90% and 87-92% respectively.<sup>11,12</sup>

Tzanakis scoring system is a combination of clinical examination, ultrasonography and inflammatory markers.<sup>13</sup> Out of 15 scores, a score of 8 or more is considered AA requiring surgical treatment. Its Sensitivity, Specifcity and accuracy are 95.4%, 97.4% and 96.5%

### Aim of the study:

The aim of this study is to compare the efficacy of Tzanakis scoring system with Alvarado scoring system in diagnosing AA.

### Method:

This Prospective and non randomized observational study was conducted in in Government Dharmapuri Medical college Hospital during 2015-2016. A total of 400 cases were studied after the Ethical approval from institutional review committee of Government Dharmapuri Medical college Hospital.

All the patients, with the clinical diagnosis of AA, who underwent laproscopic or open Appendicectomy were included in the study. Those patients with the diagnosis of appendicular perforation, appendicular lump and peendicular abscess were not included in the study. Any patient who received analgesics or sesatives before clinical diagnosis of AA were also excluded from the study. Alvarado score and

Tzanakis score observed at the time of admission were also recorded.

Final diagnosis of the AA was based on histological findings given by pathologist.

### Result:

During the study period there were 420 cases who were diagnosed clinically as AA. Out of those cases , 13 patients refused to undergo surgical intervention and discharged on request. Further 7 patients went to other hospital for further management. A total of 400 cases underwent emergency appendicectomy after clinical diagnosis of AA of which 256 cases underwent open appendicectomy and 144 cases underwent laproscopic appendicectomy. However 32 (8%) had negative appendicectomy confirmed by histologic report. In this study the most common position of the appendix was found to be Retrocaecal(79%).

In the attempt of comparing Tzanakis scoring system and Alvarado scoring system, the cut off score of 8 and cut off score of 7 were considered for Tzanakis scoring system amd the Alvarado scoring system respectively.

**Table.1 Tzanakis score and histological diagnosis.**

TZANAKIS SCORE	ACUTE APPENDICITIS	NORMAL APPENDIX	TOTAL PATIENTS
>- 8	320	8	328
<8	48	24	72
TOTAL PATIENTS	368	32	400

On the basis of Tzanakis scoring system, out of 400 patients who underwent appendicectomy, 320 patients were found to be true positive which was confirmed by histrological examination( Table.1).

Similarly, 8 patients having scored equal to or more than 8 were false positive. Further among 72 patients with score less than 8, 48 were found to be false negative (Table.1). The Sensitivity and specificity of the Tzanakis scoring system in diagnosing AA was 86.95% and 75% respectively. Its positive predictive value was 97.5% and the negative predictive value was 33.33%

**Table.2 Alvarado score and histological diagnosis.**

TZANAKIS SCORE	ACUTE APPENDICITIS	NORMAL APPENDIX	TOTAL PATIENTS
>= 7	280	8	288
<7	88	24	112
TOTAL PATIENTS	368	32	400

On the basis of Alvarado scoring system, out of 400 patients who underwent appendectomy, 280 patients were found to be true positive which was confirmed by histological examination (Table.2). Similarly, 8 patients having scored equal to or more than 7 were false positive. Further among 112 patients with score less than 7, 24 were found to be true negative (Table.2). The Sensitivity and specificity of the Alvarado scoring system in diagnosing AA was 76% and 75% respectively. Its positive predictive value was 97.2% and the negative predictive value was 21.42%.

### DISCUSSION:

Acute Appendicitis is the most common surgical emergency, it is always a difficult task for surgeon to diagnose AA.<sup>2,3</sup> Different scoring system like RIPASA, ALVARADO, OHMAN, TZANAKIS are developed to help the surgeon in decision making in doubtful cases.

Tzanakis et al have reported that its scoring system had sensitivity and specificity of 95.4% and 97.4% respectively.<sup>13</sup> As per our study, sensitivity of Tzanakis scoring system was 86.5% which is comparable to Tzanakis et al. The specificity of Tzanakis scoring system was low in our study in comparison to the findings reported by Tzanakis et al. The low specificity of Tzanakis score in our study could be due to low sensitivity of ultrasonography (USG) which had 68% sensitivity rate. It is quite low in compare to other studies which had shown the sensitivity rate of 85-96%.<sup>10-12</sup> The disparity might be due to various experience level of Ultrasonologists who were involved in this procedure. So, disparity due to individual cannot be avoided.

Alvarado score had sensitivity of 73-91% and specificity of 78-92% in various studies.<sup>10-12</sup> The sensitivity (76%) and specificity (75%) of Alvarado score in the current study is comparable.

The aim of this study is to compare the efficacy of Tzanakis score and Alvarado score in the diagnosis of AA. Tzanakis score was found superior in terms of sensitivity and negative predictive value. The specificity of Tzanakis score and Alvarado score was found the same. However, the specificity of Tzanakis score can be improved by increasing the sensitivity rate of USG if the experienced Ultrasonologist do the USG.

### CONCLUSIONS:

Though AA is a clinical diagnosis, the scoring system can competent the Clinical diagnosis. Tzanakis score is superior to Alvarado score in diagnosing AA in term of sensitivity and negative predictive values. Specificity can be increased if the sensitivity rate of the USG is increased by involving experienced Ultrasonologist.

I would like to thank the Department of Pathology and Department of Radiology for continuous support during this study.

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