

# OUT COME OF SECONDARY PERITONITIS USING APACHEE II SCORE



## Medical Science

**KEYWORDS :** APACHE II score, morbidity, mortality, secondary peritonitis

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### ABSTRACT

*Peritonitis is defined as the inflammation of the peritoneum. Acute generalized peritonitis coming forth due to underlying intestinal perforation is a critical & life-threatening medical condition. It is a common surgical emergency most of the times across the world.*

**AIM OF THE STUDY:** To evaluate the performance of APACHE II scoring system in predicting mortality in patient with peritonitis.

**MATERIAL AND METHODS:**

*This prospective study consists of 60 cases of secondary peritonitis admitted to the general surgical wards during a period of 2 years in J.S.S. Medical College Hospital, Mysore. APACHE II score was calculated and correlated with their symptoms & clinical outcomes regarding morbidity and mortality.*

**RESULT:** Patients who had score below 15 had favorable prognosis where as more than 15 had bad prognosis

**CONCLUSION:** It can be stated that APACHE II Score, which is a reflection of the effect of various risk factors on the disease process in an individual, is a reliable indicator of the possible outcome in patients with intra abdominal sepsis.

### INTRODUCTION

Peritonitis is defined as the inflammation of the peritoneum and is one of the common acute abdominal emergencies that are present at the surgical department. It may be categorized into three stages based upon the nature & source of microbial contamination. Primary peritonitis is an infection without any visceral perforation, usually from extra-peritoneal source and monomicrobial in origin. Secondary peritonitis is the most common & follows an intra-peritoneal source usually from perforation of hollow viscera. When not treated or treatment fails it usually develops into tertiary stage that is potential fatal affliction although advances are available in diagnosis, surgical techniques, antimicrobial therapy & intensive care support. The diagnosis of peritonitis is made largely by clinical evaluation. Routine investigative studies add little specific information in evaluation. Once a definitive diagnosis is made improvement of the general condition of the patient so as to enable him / her to withstand surgery and the required anesthesia, is the primary concern. During surgery the priorities are to control the source of peritoneal insult or contamination, reduce the intraperitoneal bacterial load and also to prevent persistence or recurrence of intra-abdominal infection. A number of factors influence the outcome, like disease specific elements, patient related factors as well as the choice of therapeutic intervention. It would be of great help if a scoring system is also available for prediction of outcome in cases of peritonitis. In 1981, Knauss et al. developed the Acute Physiology And Chronic Health Evaluation Score (APACHE) based on 34 physiological parameters. APACHE II was later developed as a simplified clinically useful system using 12 physiological variables

**AIM OF THE STUDY:**

To evaluate the performance of APACHE II scoring system in predicting mortality in patient with peritonitis.

**MATERIALS AND METHODS**

This prospective study consists of 60 cases of intra abdominal sepsis admitted to the general surgical wards during a period of 2 years in J.S.S. Medical College Hospital, Mysore. All the patients chosen for this study had proven peritonitis originating from stomach or duodenum, small bowel, large bowel, appendix, post

operative complications, hepatobiliary system, and other miscellaneous causes. Patients with appendicitis were included only if there was free perforation with generalized peritonitis. Mortality in this study refers to death of the patient in the hospital during the same admission as the episode of intra abdominal sepsis.

**RESULT:**

This study includes 60 patients with intra abdominal sepsis (49 males and 11 females). The overall mortality in this study was 8.3%.

**Table 1.Age and Sex distribution of the Cases**

	Males		Females		Total	
	NO	%	NO	%	NO	%
less than 15	0	0	0	0	0	0
16 to 25	11	22.4	2	18.2	13	21.7
26 to 35	9	18.4	1	9.1	10	16.7
36 to 45	9	18.4	2	18.2	11	18.3
46 to 55	7	14.3	1	9.1	8	13.3
56 to 65	10	20.4	3	27.3	13	21.7
above 66	3	6.1	2	18.2	5	8.3
Total	49	100	11	100	60	100

Males accounted for 81.7% of the cases while females accounted for 18.3%, the sex ratio being 4.4:1 (M:F).

The maximum number of patients were in the age group of 16 - 25 and 56 - 65 years (21.7 %) followed by those in 36 - 45 years group (18.3%) and 26 - 35 years group (16.7%).

**TABLE II Mean Age and Standard Deviation Of the cases according to Sex**

	Males	Females	Total (M + F)
Mean (yrs.)	42.8	47.3	43.65
Standard Deviation (yrs.)	17.4	18.3	17.49

From the above table it can be observed that the mean age among males was 42.8 years with a Standard Deviation of 17.4 years, while among females the mean age was 47.3 years with a Standard Deviation of 18.3 years. The difference in the mean age was statistically significant ( $P < 0.05$ ) for both sexes put together.

The overall mean age of the patients in this study was 43.65 years while the Standard Deviation was 17.4 years.

**Table III showing CFR according to Age and Sex**

Age in years	Males	Deaths	CFR%	Females	Deaths	CFR %	Total Cases	Total Deaths	Total CFR
less than 15	0	0	0	0	0	0	0	0	0
16 to 25	11	0	0	2	0	0	13	0	0
26 to 35	9	0	0	1	0	0	10	0	0
36 to 45	9	0	0	2	0	0	11	0	0
46 to 55	7	1	14.28	1	0	0	8	1	12.5
56 to 65	10	2	20.0	3	1	33.3	13	3	23.1
above 66	3	1	33.33	2	0	0	5	1	20
Total	49	4	8.16	11	1	9.1	60	5	8.3

The CFR among males was maximum in the age group of 66 years constituting 33.3% while among females it was 33.3% in the age group 56 - 65 years.

The maximum total CFR was observed in the age groups of 56 - 65 years accounting for 23.1% each followed by patients in age group above 66 years accounting for 20%.

**Table IV Source of Infection and CFR**

Source	No. of cases	Percentage	No. of deaths	CFR %
Gastroduodenal	40	66.6	2	5.0
Small bowel	15	25	2	13.3
Large Bowel	2	3.33	1	50
Appendix	3	8.33	0	0
Total	60	100.0	5	8.33

**CFR is case fatality rate**

All the patients had generalized peritonitis and abdominal infection was spontaneous in all of them. 40 patients had perforation of either gastric or duodenal ulcer, 15 patients had small intestinal perforation, 2 had large intestinal perforation and 3 patients had appendicular perforation with generalized peritonitis.

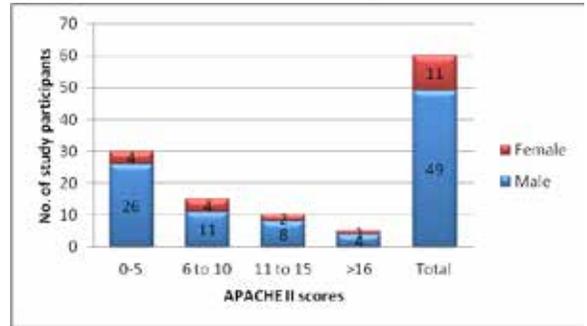
**Table VI APACHE II Score and CFR**

Apache II score	No. of patients			No. of deaths		CFR		
	TOTAL	Male	Female	Male	Female	Male	Female	TOTAL
0-5	30	26	4	0	0	0	0	0
6-10	15	11	4	0	0	0	0	0
11-15	10	08	2	0	0	0	0	0
>16	05	04	1	4	1	100	100	100
Total	60	49	11	4	1	8.2	9.1	8.3

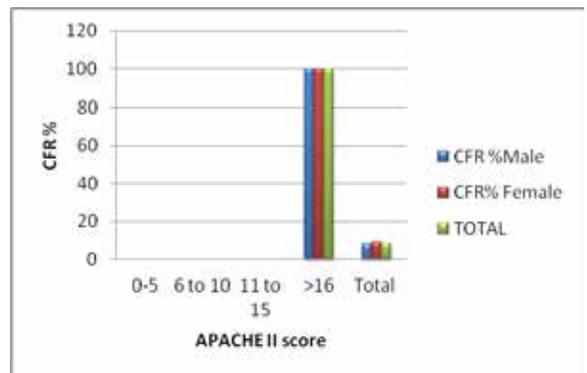
The overall mean APACHE II score for 60 patients was ranging from 1 to 22. The mean APACHE II score in patients who expired was 20.8 compared to 6.03 in survivors.

An increase in APACHE II score was associated with increased likelihood of mortality, as shown in the table below. There were 5 patients with APACHE II score above 16 of which all 5 expired with a CFR of 100%. This is a significant prognostic factor in patients with intra-abdominal sepsis.

**FIGURE: 1 APACHE II Score and no of patient**



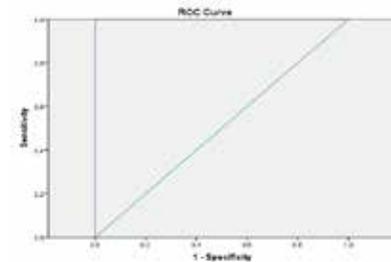
**FIGURE: 2 APACHE II Score and CFR**



Coordinates of the Curve		
Test Result Variable(s):APACHEII		
Positive if Greater Than or Equal To	Sensitivity	1 - Specificity
.0000	1.000	1.000
1.5000	1.000	.982
2.5000	1.000	.873
3.5000	1.000	.727
4.5000	1.000	.564
5.5000	1.000	.455
6.5000	1.000	.364
7.5000	1.000	.255
8.5000	1.000	.236
9.5000	1.000	.218
10.5000	1.000	.182
11.5000	1.000	.109
12.5000	1.000	.055
13.5000	1.000	.018
15.0000	1.000	.000
17.0000	.800	.000
19.0000	.600	.000
20.5000	.400	.000
24.0000	.200	.000
28.0000	.000	.000

a. The smallest cut-off value is the minimum observed test value minus 1, and the largest cut-off value is the maximum observed test value plus 1. All the other cut-off values are the averages of two consecutive ordered observed test values.

Hence APACHE II score >14 would have sensitivity 100% and specificity >98% for predicting mortality.



Area Under the Curve Test Result Variable(s):APACHEII

Area	Asymptotic Sig	Asymptotic 95% Confidence Interval	
		Lower Bound	Upper Bound
1.000	.000	1.000	1.000

**RESULT:**

Peritonitis was recognized as uniformly fatal condition more than 2500 years ago. Surgical interventions not attempted until early in the century finally reduced a near total incidence of mortality to the range of 50 percent.

Twenty years ago acute appendicitis appeared as the most common cause of peritonitis. Next common causes of intra abdominal sepsis are perforated peptic ulcer (25%) post operative causes (10%) and gynecological causes (5%). In many Indian studies typhoid perforation of the small bowel is also importance. Bohnen, Boulanger and their colleagues from Royal Victoria Hospital Montreal, in a study of 176 patients with intra abdominal sepsis reported a mortality rate of 38%<sup>3</sup>.

Dellinger et al from Washington in a study of 187 patients with intra abdominal infection reported a mortality rate of 24%<sup>4</sup>.

Kalfarentzos et al. from Greece found that out of 42 cases, 19 died with an overall mortality of 45%<sup>5</sup>.

Pine et al reported that 32 of their 117 patients with intra abdominal sepsis died with mortality rate of 27%<sup>6</sup>.

In the present study of 60 cases of intra abdominal sepsis due to various causes, 5 died. The overall mortality in this study was 8.3%.

In this present study the mean APACHE II Score was 7.23 with a range of 1 to 27. The mean APACHE II score in patients who died was 20.4 compared to 6.0 in survivors. Increase in APACHE II score is directly proportional to the mortality rate. Above the score of 16 all patients died.

This study also confirms the ability of APACHE II score to predict the mortality and morbidity rate in secondary peritonitis patients<sup>7,8</sup>.

**CONCLUSION**

It can be stated that APACHE II Score, which is a reflection of the effect of various risk factors on the disease process in an individual, is a reliable indicator of the possible outcome in patients with intra abdominal sepsis. However the number of patients studied in this series as such is small compared to the high incidence of peritonitis and a larger number of patients need to be studied to come to a definite and statistically significant conclusion.

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