

ORIGINAL ARTICLE

A prospective study correlating apache score with outcome and complications of peritonitis

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ABSTRACT:

Background: The outcome of an abdominal infection depends on the complex interaction of many different factors and the success obtained with the early institution of specific therapeutic procedures. It also depends upon the exact recognition of the seriousness of the diseases and an accurate assessment and classification of the patient's risks. The present study was undertaken to evaluate complications and outcome of patients with perforation peritonitis using APACHE II scoring system. **Material and Methods:** The present study was commenced among 50 patients who underwent laparotomy for acute peritonitis due to gastrointestinal perforation, after diagnostic confirmation at Rajindra Hospital, Patiala. All patients were evaluated clinically, haematological and biochemical investigations were carried out. X-Ray Abdomen Erect and supine, Plain X-ray chest-PA View and ultrasound whole abdomen were done. The acute physiological parameter of APACHE II were assessed and recorded at the admission point preoperatively and were scored in accordance with the APACHE II chart. **Results:** 65 % of patients had hospital stay of 10-12 days and on the other hand 30 % had 13-15 days. I, mean APACHE II score with highly significant P-Value of 0.001. Out of 50 patients, total 10 patients died, in which 4 patients each with duodenal and ileal perforations and 2 with gastric perforation. The mean APACHE II score in patients who died was 21.50 ± 5.082 S.D with highly significant P. Value < 0.001 **Conclusion:** Cases of peritonitis carry a high mortality which can be reduced by early diagnosis, risk stratification, appropriate treatment based on risk score. Delayed presentation which has important effect on both mortality and morbidity is beyond our control. Only adequate Health education, proper referral mechanism can help to overcome this factor

Key words: Peritonitis; Mortality; Complication.

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INTRODUCTION

Acute generalized peritonitis from gastrointestinal hollow viscus perforation is a potentially life threatening condition. It is a common surgical emergency in many general surgical units in the developing countries and it is often associated with high morbidity and mortality.^{1,2} Despite the surgical treatment, sophisticated intensive care units, last generation antibiotics and a better understanding of pathophysiology, the mortality rate of perforation peritonitis is still high. The outcome of an abdominal infection depends on the complex interaction of many different factors and the success obtained with the early institution of specific therapeutic procedures. It also depends upon the exact recognition of the seriousness of the diseases and an accurate assessment and classification of the patient's risks. Early prognostic evaluation of peritonitis is

desirable to select high risk patients for more aggressive therapeutic procedure such as radical debridement, lavage, open management and planned laparotomy. An accurate risk index classification is the only way to settle a standard of comparison between group of patients and different treatment methods which would allow prospective adequate comparative studies. Grading the severity of acute peritonitis has assisted in no small way in decision making and has improved therapy in the management of severely ill patients³

Scoring systems have been advocated as prognostic predictors, they reduce all the clinical problems including lots of variables to a simple number.⁴ Empirically based risk assessment for important clinical events has been extremely useful in evaluating new therapies, in monitoring resources for effective use and improving quality of care.^{3,5,6}

Hence the present study was undertaken to evaluate complications and outcome of patients with perforation peritonitis using APACHE II scoring system.

MATERIAL AND METHODS

The present study was commenced among 50 consecutive patients who underwent laparotomy for acute peritonitis due to gastrointestinal perforation, after diagnostic confirmation at Rajindra Hospital, Patiala. Diagnosis of peritonitis was established by History, examination, radiological findings and operative findings of surgical interventions during management. Patient who presented with features of peritonitis and had no evidence of perforation radiologically and preoperatively, patients with post-operative peritonitis, patient with iatrogenic perforation during laparotomy or endoscopy and perforation peritonitis in paediatric age group were excluded from the study.

All patients were evaluated clinically. Haematological and biochemical investigations were carried out. X-Ray Abdomen Erect and supine, Plain X-ray chest-PA View and ultrasound whole abdomen were done. The acute physiological parameters of APACHE II were assessed and recorded at the admission point preoperatively and were scored in accordance with the APACHE II chart.⁷

The scores ranged from 0 to 4 on each side of normal value. Zero represents normal values and increase to 4 indicating the extreme end of high or low abnormal values. Chronic ill health value was added if the patient had history of organ system insufficiency or is immuno-compromised, points were assigned as discussed earlier. The Sum total of the acute physiological scores (APS), Age point and chronic health values is the total APACHE II Score. All the parameters were entered in the APACHE II Table Performa. Surgery in the form of laparotomy was done under general anaesthesia in all cases.

Patient's data i.e. outcome, complications and follow-up was collected on pre-designed Performa and the observations obtained were tabulated and analysed using appropriate statistical methods.

STATISTICAL ANALYSIS

Descriptive statistics were used to summarize the data. The statistical significance of data was evaluated by applying the Pearson's chi-square test. P-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1 shows 65 % of patients had hospital stay of 10-12 days and on the other hand 30 % had 13-15 days. It is clear from the table that more the hospital stay more is mean APACHE score which was associated with post op complications.

Table 1: Hospital Stay in survivors

Total Hospital Stay	Number	Percentage	Mean APACHE II score
10-12	26	65	10.03
13-15	12	30	14.58
16-18	2	5.0	20.5
Total	40	100	

Table 2 shows more the hospital stay more is mean APACHE II score with highly significant P-Value of 0.001 which is most probably associated with more post op complications

Table 2: Hospital Stay in survivors with mean Apache II Score

APACHE II Score	Hospital Stay			
	Mean	S.D	P value	Significance
≤ 10	12.473	4.984	0.001	HS
>10	18.75	6.254		

Table 3 shows it is clear that out of 50 patients, total 10 patients died, in which 4 patients each with duodenal and ileal perforations and 2 with gastric perforation. The mean APACHE II score in patients who died was 21.50±5.082 S.D with highly significant P. Value <0.001. It shows that outcome as death of patients seems to be directly proportional to APACHE II score.

Table 4 shows that that patients having APACHE II score more than 10, seems to be of high risk group. The most common complication encountered was wound sepsis and dehiscence and second most common complication was paralytic ileus. On the other hand worst outcome was mortality in 10 patients. As the score increases, the no. of complications increases. If score is more than 20 more are the chances of mortality. It is evident from data given below APACHE II score is significantly associated with chances of patient developing post operative complications.

Table 3: Relation of death with mean APACHE II score

Death	Number	Percentage	Deaths			Apache II score		
			Ileal	Duodenal	Gastric	Mean±SD	P value	Significance
Yes	10	20.0				21.50± 5.082	<0.001	HS
No	40	80.0	4	4	2	12.10± 4.442		
Total	50	100.0						

Table 4: Correlation of complications with apache – II score

Complications	APACHE II score				P. Value
	Score≤10/No. Of Pts.=16	Score11-15/ No. Of Pts.=13	Score16-20/no. of Pts.=12	Score >20/ No. of Pts.=9	
Wound infection/ dehiscence	1	2	7	1	0.029
Faecal fistula	0	0	1	0	-
Paralytic Ileus	0	6	1	1	0.044
Mortality	0	1	2	7	0.045
Ventillatory Support	0	1	3	8	0.039
SIGNIFICANCE			S		

Table 5: Correlation of APACHE II score with outcome

OUTCOME	No.	APACHE II Score					
		Up to 10		From 10-20		More Than 20	
Discharged	40	16	100.0%	22	88.00%	2	22.22%
Expired	10	0	0.0%	3	12.00%	7	77.77%
Total	50	16		25		9	

Table 5 shows correlation of APACHE II score with outcome. It is evident that as the score increases outcome of patients worsens. It is clear that out of 40 survived patients 16 patients had score up to 10 who discharged in satisfactory condition where as in score above 10 there was 3 mortalities and in score more than 20 maximum mortalities were observed that is 7. Those who survived in score more than 10 were treated intensively and discharged in satisfactory conditions

DISCUSSION

This study was conducted among 50 patients who presented to the surgical emergency department and were diagnosed with hollow viscous perforation. All the patients were appropriately assessed and managed according to the standard guidelines.

In this study APACHE II score was used as a tool to assess severity in patients of perforation peritonitis in which score 63 was taken as maximum and 2 as minimum. The APACHE II system is based on the 13 acute physiological variables; the value of each variable is recorded during the first 24 h of the patient's admission and a score of 0–4 is ascribed to each variable of acute physiology score (APS). The proposed study aimed to define the severity of perforation peritonitis based on APACHE II Score and to take necessary precautions to minimise adverse outcomes.

There is no ideal scoring system for the preoperative evaluation of patients undergoing emergency surgery as regards to mortality and morbidity. Some pre-operative scoring systems provide approximate estimates of mortality risk but none have been shown to be sufficiently specific for use on individual patients. There are also no criteria which define the type of surgical procedure based on the sepsis score. Simplified acute physiology score, sepsis severity score, multiple organ failure score, Mannheim Peritonitis Index, Ransom and Imrie score, have been used to grade sepsis and prognosis. However, none of the existing scoring

systems has fulfilled all expectations. Only the APACHE II score contribute independently to the prediction of outcome and has received the most attention worldwide and is thus highly validated in use. It has the advantage of being simple to use and the parameters demanded of the test are easily measured in any hospital to look after seriously ill patients.^{8,9}

The present study reports various complications and their relation to APACHE II. It is clear from the tables that as the APACHE II score increases, the percentage of complication increases and hence hospital stay. The most common complication encountered was wound sepsis and dehiscence and second most common complication was paralytic ileus. On the other hand, worst outcome was mortality in 10 patients. Complications such as wound infection/wound dehiscence and intra-abdominal collections were statistically significantly ($P < 0.05$) more in patients with APACHE II score ≥ 10 .

A study by Ahuja et al¹⁰ found that patients having high APACHE II score, i.e., more than 20, had significantly higher incidence of postoperative complications as compared to patients with APACHE II scores < 10 which is also evident in present study.

Similar result were found in a study by Sahu SK et al¹¹ where APACHE II score was measured before the treatment of secondary peritonitis correlated significantly with the disease outcome w.r.t mortality and morbidity.

In our study, mean APACHE II score in patients who died was 21.50 ± 5.082 S.D with highly significant P Value < 0.001 . It shows that outcome as death of patients seems to be directly proportional to APACHE II score.

Comparatively, in study conducted by Bohnen et al,² Adesunkanmi et al,¹² the mean APACHE II score among survivors was 8 (low risk group) and among non-survivors was 22.4 (high risk group). Thus conclusive of the fact that mortality is directly linked with higher scores.

The mean length of hospital stay following treatment in survivors found to be 12 days as compared to 18 days in a study done by Bohnen et al,² in another study of colonic perforation, Kamatsu et al¹³ found that APACHE II score 19 or more was significantly related to poor prognosis as seen in present study.

In present study, low risk group of 32% patients (APACHE II score less than 10) and all were discharged in satisfactory condition. 25 patients had score between 10-20 and out of that 3 died and 22 discharged after treating few complications. On the other hand only 9 patients constituting high risk group (score>20) had 7 deaths and 2 were discharged after prolonged hospital stay and intensive care.

The overall mortality in our study was 20% but study by Archampong¹⁴ observed 39.6% mortality in those presenting within 48 h and 80% in those presenting after 4 days.

Comparatively, in study conducted by Bohnen et al,² Adesunkanmi et al,¹² the mean APACHE II score among survivors was 8 (low risk group) and among non-survivors was 22.4 (high risk group). Thus conclusive of the fact that mortality is directly linked with higher scores.

This study confirmed steadfastness of APACHE II score to predict the mortality and morbidity rates in secondary peritonitis patients.

Although this study correlates well with high APACHE II and poor outcome, it has few limitations. This study is based on a small group of patients in a single centre. Each institution has its own institutional protocols to deal with patients which can affect the surgical outcome of the patients. Further large group multicenter studies are needed to make any valediction.

Evaluation of severity, therapeutic approach and treatment effectiveness of acute generalized peritonitis from perforation is found to be obstructed due to gross & overlapping classification criteria. To justify corrects, timely & aggressive treatment to selected high risk patients of severe peritonitis, early prognostic evaluation is highly desirable.

CONCLUSION

In our study the patients with score less than 10 (32%) were as low risk group and between 10- 20 (50%) as moderate risk and score more than 20(18%) as high risk group had high mortality. Cases of peritonitis carry a high mortality

which can be reduced by early diagnosis, risk stratification, appropriate treatment based on risk score. Delayed presentation which has important effect on both mortality and morbidity is beyond our control. Only adequate Health education, proper referral mechanism can help to overcome this factor.

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