

ORIGINAL RESEARCH

Role of apache II scoring in prognosis of peritonitis

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ABSTRACT

Background: Inflammation of the serosal membrane that borders the abdominal cavity and the internal organs is referred to as peritonitis. Peritonitis typically progresses to a deadly tertiary stage if left untreated or if therapy is unsuccessful. Grading the severity of acute peritonitis has improved therapy and helped with decision-making in the care of critically sick patients. The most often utilized of these are the sepsis severity score, the simplified acute physiology score, and the acute physiology and chronic health assessment score (APACHE II). **Materials & methods:** In this study a sample size of 75 patients was taken. A Meticulous symptomatic history of all those patients presented with acute abdomen & pre-morbid conditions were well-catalogued accurately along with their general past history. Once the diagnosis of peritonitis was confirmed then the patient's APACHE II score were assessed categorically within 24 hours of admission. Bilateral flank drainage or conservative management was done to those unfit for surgery. Post-operative outcomes were assessed. Results were processed using SPSS software version 24. **Results:** Majority of the subjects belonged to 31-40 years (34.7%) followed by > 40 years (33.3%), 21-30 years (25.3%) and 11-20 years (6.7%). Maximum No. of patient were in APACHE 2 score 0-15 (56%) followed by APACHE 2 score 16-30 (37.3%) and least in APACHE 2 score 31-45 (6.7%). Local complications Surgical site infections (18.7%), Prolonged ileus (10.7%), Anastomotic leak (4.0%), Fecal fistula (1.3%) and Intraabdominal abscess (1.3%) were significantly more among APACHE II scores (31-45) compared to scores (16-30) and (0-15). There was no significant difference in Systemic complications like Sepsis (13.3%), ARDS (5.3%) and Acute renal failure (2.7%) between categories of APACHE II SCORE. Mortality was significantly more in APACHE II score (31-45) as compared to score (16-30) which was significantly more than score (0-15).

Key words: APACHE II, Peritonitis, Prognosis

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INTRODUCTION

Inflammation of the serosal membrane that borders the abdominal cavity and the internal organs is referred to as peritonitis. Currently, there are three categories of peritonitis based on the kind and source of microbial infection. There is no visceral hole in primary peritonitis, which is an infection. In the entire world, secondary peritonitis is the most typical form of the condition. Following an intraperitoneal source, secondary peritonitis typically results from perforation of a hollow viscus. Following the failure of secondary peritonitis therapy, tertiary peritonitis develops.^{1,2}

Abdominal surgical infections have a complex character that makes it challenging to correctly identify the illness, evaluate its severity, and track the effectiveness of treatment. The outcome is influenced by the anatomic source of the infection as well as, to a greater extent, the physiologic impairment it causes.^{1,2}

Peritonitis typically progresses to a deadly tertiary stage if left untreated or if therapy is unsuccessful. Despite improvements in diagnosis, surgical methods, antimicrobial therapy, and critical care support, there is still a significant morbidity and fatality rate. Superimposed infections can cause the peritoneal cavity to get infected with bacteria, which can then develop into an abscess and sepsis, which has a high fatality risk.³

Grading the severity of acute peritonitis has improved therapy and helped with decision-making in the care of critically sick patients. The risk assessment using crucial clinical parameters has proved very helpful in assessing novel medications, tracking resource usage, and raising the standard of care. Numerous grading systems have been shown successful in forecasting the course of critically sick patients' conditions, allowing for the efficient deployment of resources. The most

often utilized of these are the sepsis severity score, the simplified acute physiology score, and the acute physiology and chronic health assessment score (APACHE II). The Mannheim Peritonitis Index and the Peritonitis Index ALTONA II are additional metrics for determining the severity of peritonitis.⁴⁻⁶ With sensitivity and specificity equivalent to the APACHE II score, which has been accepted as the gold standard by the Surgical Infection Society, the Mannheim Peritonitis Index (MPI) has emerged as a viable marker for determining the severity and prognosis of intra-abdominal infection. This score, which incorporates preoperative and postoperative data and is simple to use, was created particularly for peritonitis.^{7,8}

MATERIALS & METHODS

The present study was conducted for assessing the role of APACHE II scoring in the prognosis of peritonitis. It was a cross-sectional Analytical Study conducted in general Surgery Department in Sharda Hospital, SMSR& H, GreaterNoida. Thus; in this study a sample size of 75 patients was taken.

INCLUSION CRITERIA

- Patients aged > 18 years
- Patients diagnosed as peritonitis undergoing surgery

EXCLUSION CRITERIA

- Patients with malignancy
- Patients in immunocompromised state such as HIV
- Pregnant ladies
- Patients who get discharged against medical advice which prevents follow up on outcome
- Patients whose duration of stay less than 24 hours
- Patients in whom any of the 12 physiological variables were missing

A Meticulous symptomatic history of all those patients presented with acute abdomen & pre-morbid conditions were well-catalogued accurately along with their general past history. Complete physical examination were performed during initial assessment, following routine investigations on all patients i.e., complete Hemogram, RFT, LFT, ECG etc. Relevant investigations required to make a diagnosis of peritonitis were done and once the diagnosis was established, only those patients were included. Once the diagnosis of peritonitis was confirmed then the patient’s APACHE II score were

assessed categorically within 24 hours of admission. Routine management of patients was carefully done as per the standard departmental protocol. All patients were resuscitated with IV fluids along with emendation of electrolyte imbalances. Broad spectrum antibiotics were given to all patients, GI decompression was done through Ryle’s tube. Those patients who can withstand general anaesthesia were managed for exploratory laparotomy for peritoneal toilet and source control. Bilateral flank drainage or conservative management was done to those unfit for surgery. Post-operative outcomes were assessed. Results were processed using SPSS software version 24.

RESULTS

Majority of the subjects belonged to 31-40 years (34.7%) followed by > 40 years (33.3%), 21-30 years (25.3%) and 11-20 years (6.7%). There were 72.0% males and 28.0% females. There was Enteric perforation among 56.0%, Appendicular perforation among 17.3%, Peptic perforation among 9.3%, Tubercular perforation among 5.3%, Traumatic small bowel perforation among 6.7%, Traumatic large bowel perforation among 2.7%, Ileal perforation following MTP among 1.3%, Strangulated inguinal hernia with ileal perforation among 1.3% patients. Maximum No. of patient were in APACHE 2 score 0-15 (56%) followed by APACHE 2 score 16-30 (37.3%) and least in APACHE 2 score 31-45 (6.7%). The symptoms reported were Pain abdomen (100.0%), Fever (28%), Vomiting (49.3%), Distension (85.3%) and Non-passage of flatus and stools (40.0%). The mean Hospital Stay (in days) was significantly more among APACHE 2 score 31-45 than in APACHE II score (16-30) which was more than APACHE II score (0-15). The mean ICU Stay (in days) was significantly more among APACHE 2 score 31-45 than in APACHE II score (16-30) and score (0-15). Local complications Surgical site infections (18.7%), Prolonged ileus (10.7%), Anastomotic leak (4.0%), Fecal fistula (1.3%) and Intraabdominal abscess (1.3%) were significantly more among APACHE II scores (31-45) compared to scores (16-30) and (0-15). There was no significant difference in Systemic complications like Sepsis (13.3%), ARDS (5.3%) and Acute renal failure (2.7%) between categories of APACHE II SCORE. Mortality was significantly more in APACHE II score (31-45) as compared to score (16-30) which was significantly more than score (0-15).

Table 1: Etiological distribution of Peritonitis Patients

Variable	Frequency	Etiology
Enteric perforation	42	56.0%
Appendicular perforation	13	17.3%
Peptic perforation	7	9.3%
Tubercular perforation	4	5.3%
Traumatic small bowel	5	6.7%

perforation		
Traumatic large bowel perforation	2	2.7%
Ileal perforation following MTP	1	1.3%
Strangulated inguinal hernia with ileal perforation	1	1.3%

Table 2: Mean Hospital stay days in Peritonitis Patients

APACHE 2 SCORE	Mean hospital Stay (in days)	F-value	p-value
0-15	6.52	4.926	0.010 (Significant)
16-30	8.25		
31-45	10.60		
Total	8.46		

Table 3: Mortality distribution in Peritonitis Patients

Mortality		APACHE 2 score			Total
		0-15	16-30	31-45	
Absent	Number	42	26	0	68
	Percentage	100	92.8	0	90.6
Present	Number	0	2	5	7
	Percentage	0	7.2	100	9.3
Total	Number	42	28	5	75
	Percentage	100	100	100	100
p-value		0.001 (Significant)			

DISCUSSION

In our study, majority of the subjects belonged to 31-40 years (34.7%) followed by > 40 years (33.3%), 21-30 years (25.3%) and 11-20 years (6.7%) with 72.0% males and 28.0% females. Ahuja and Pal focused on individuals from 16 to 80 years old, with the majority (50%) of the population falling between the ages of 21 and 40.¹

In our study, the patients were classified based on the etiology and Enteric perforation was found in 56.0%, Appendicular perforation in 17.3%, Peptic perforation in 9.3%, Tubercular perforation in 5.3%, Traumatic small bowel perforation in 6.7%, Traumatic large bowel perforation in 2.7%, Ileal perforation following MTP was seen in 1.3%, Strangulated inguinal hernia with ileal perforation in 1.3% subject. Ahuja and Pal stated that ileal perforations are most often diagnosed during laparotomies.¹

In present study, the presentation of patients were with 1) Pain abdomen (100.0%), 2) Distention (85.3%), 3) Vomiting (49.3%), 4) Fever (28%) and Non-passage of flatus and stools (40.0%). Ahuja and Pal also stated that the most frequent symptom experienced by individuals with perforated peritonitis was abdominal pain (100%) followed by vomiting (70%) constipation (70%) and fever (50%) in that order.¹

In our study, the mean Hospital Stay (in days) was significantly more in APACHE II score 31-45 than in a group of APACHE II scores (16-30). The APACHE II score of 19 or above was substantially connected to a bad prognosis, as demonstrated in the current research, according to Kamatsu et al investigation of colonic perforation. Kalra et al found that APACHE-II score and hospital stay were shown to be unrelated,

with typical hospital stays for scores of 0-4, 5-9, 10-14, 15-19, and >19 being 7.71, 9.73, 10.75, 5.75, and 6.5 days, respectively. In our study the mean hospital stay days for APACHE 2 scores 0-15, 16-30, 31-45 were 6.52, 8.25 and 10.60 respectively.⁹

In our study, Mortality was significantly more among APACHE II score (31-45) than in score (16-30) and of score (0-15). The mean Age, ICU stay (in days) and APACHE 2 score was significantly more among Non-Survivors compared to Survivors. Kulkarni et al. stated that mean APACHE-II score for survivors was 9.88, compared to 19.25 for non-survivors. The area under the curve was determined to be 0.984 using ROC analysis. A perfect association between the APACHE-II score and the anticipated death rate was found.¹⁰ The mean APACHE II score for survivors in the research by Bohnen et al., Adesunkanmi et al., and Agarwal S et al was 8 (low risk group), but it was 22.4 for non-survivors (high risk group). Thus, it can be said with certainty that higher scores have a direct correlation with mortality.^{11, 12}

In our study, the mean APACHE II score was 11.97 and 44.80 for survivors and non survivors respectively. Gupta et al observed that the average APACHE II score was 13.13 +/- 8.62. In our study, the average APACHE II score was 13.4 +/- 4.12. The mean APACHE II score for survivors was 10.99, compared to 25.27 for non-survivors.¹³ The average APACHE II score in the research by Agarwal S et al was 8 among survivors and 22.4 among non-survivors. Hence, it may be said that higher scores have a direct correlation with mortality. The results agreed with those of Kulkarni et al who found a mean predicted mortality of 23%.^{9, 12}

The APACHE-II score for peptic perforation was also studied by M. Schein et al. They found that the mean score for survivors was 10.8 while the mean score for non-survivors was 17.5. None of the people who had a score of 0–10 died. The death rate was 5.4% for those who scored 11 to 15, 44% for those who scored 16 to 20, and 66.6% for those who scored higher than 20.¹⁴ Patients with lower scores (0-9) had a positive prognosis with a mortality rate of only 13%. In the study by Adesunkanmi et al. the prognosis got worse as the score went up to 10–19, with 50% mortality. Patients with scores more than 20 and fatality rates greater than 38% had the worst prognosis.¹¹ Acute generalized peritonitis from perforation evaluation of severity, therapeutic strategy, and treatment success is found to be hampered by gross & overlapping diagnostic criteria. Early prognostic assessment is extremely desired to support correct, prompt, and aggressive therapy to chosen high risk patients with severe peritonitis. For this investigation, the APACHE II score was used to determine the definitive procedure. The research came to the conclusion that in young patients with a single hole and an early presentation discovered with little peritoneal contamination, uncomplicated perforation closure is preferred.¹

CONCLUSION

Concomitantly with the aforementioned findings, acute generalized peritonitis, a serious and potentially fatal medical emergency, calls for careful thought in its therapy. This management must be financially possible, acceptably practicable, and result-oriented. Additionally, along with managing it, there is an urgent need for better allocating and using different high-tech medical resources, particularly in ICU. This calls for careful case analysis and prioritizing those changes depending on the issue.

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