

Original Research Article

Apache II score in predicting surgical outcome in patients of secondary peritonitis: a prospective and observational study

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ABSTRACT

Background: Peritonitis is defined as inflammation of the serosal membrane that lines the abdominal cavity and the organs contained therein. Secondary peritonitis presenting as acute generalized peritonitis is a common surgical emergency often associated with significant morbidity and mortality. Many scoring systems have been found useful in predicting the outcome in critically ill patients, thus allowing application of resources for effective use. Amongst them acute physiology and chronic health evaluation score (APACHE II), have a strong relationship to the outcome than previous groupings without consideration for systemic effect of the intra-abdominal sepsis.

Methods: This study was conducted in the Department of General surgery, Sri Maharaja Hari Singh (SMHS) Hospital an associated hospital with the Government Medical College Srinagar, J&K, India. The prospective study was conducted over a period from October 2016 to September 2018 (Two Year) on 108 patients diagnosed with secondary peritonitis. Data was collected and analysed using SPSS v 20.

Results: study included 108 patients with males involving 74.1% (80). The mean age of our study was 34 yr. (2-88 yr.), and 21-40 yr. (44.5%) group was mostly involved. Pain abdomen was present in 100% patients followed by nausea/vomiting (88%). Higher the APACHE VII score higher were post-operative complications (31+ score group 100%), mortality (31+ score group 100%) and less hospital stay (31+ score group 1.5 days) due to increased mortality.

Conclusions: APACHE II score correlated well with postoperative complications, outcome, hospital stay. However, in patients with very high Apache score more than 30, the mean duration of hospital stay is less due to associated increased mortality during early Hospital stay.

Keywords: Apache II, Peritonitis, Perforation

INTRODUCTION

Peritonitis is defined as inflammation of the serosal membrane that lines the abdominal cavity and the organs contained therein. Currently, peritonitis is organized into three divisions based upon the source and nature of microbial contamination. Primary peritonitis is an infection without any visceral perforation. Secondary peritonitis is the most common type of peritonitis all over

the world. Secondary peritonitis follows an intraperitoneal source usually from perforation of a hollow viscus. Tertiary peritonitis develops following treatment failure of secondary peritonitis.¹ In contrast to the Western literature, where lower gastrointestinal tract perforations predominate, upper gastrointestinal tract perforations constitute the majority of cases in India and the subcontinent.^{2,3} Secondary peritonitis usually presents as acute generalized peritonitis which is a potentially life-

threatening condition. It is a common surgical emergency in most of the general surgical units, across the world. It is often associated with significant morbidity and mortality.^{4,5} Grading the severity of acute peritonitis has assisted in decision making and has improved therapy in the management of severely ill patients.⁶ The risk assessment by important clinical parameter has been extremely useful in evaluating new therapies, in monitoring resources utilization and improving the quality of care.^{7,8}

Many scoring systems have been found useful in predicting the outcome in critically ill patients, thus allowing application of resources for effective use.⁹ Amongst them acute physiology and chronic health evaluation score (APACHE II), simplified acute physiology score (SAPS), sepsis severity score is mostly used and other scores specifically for peritonitis like the Mannheim peritonitis index and the peritonitis index altona II. In APACHE II all the parameters measured found to have a strong relationship to the outcome than previous groupings without consideration for systemic effect of the intraabdominal sepsis.

Aims and objectives was to study the relation of APACHE II score with post-operative complications. APACHE II score and duration of hospital stay. APACHE II score and clinical outcome

METHODS

The prospective study was conducted over the period of 2 years (oct 2016-oct2018) on 108 patients diagnosed with intestinal perforation. The study was done in the “Department of Surgery, Government Medical College Srinagar”.

Inclusion criteria

All the patients clinically diagnosed as secondary peritonitis including abdominal trauma and patients of both sexes, irrespective of the duration of illness and etiology were included in the study.

Exclusion criteria

Patients on steroids and immunosuppressive drugs.

Method of data collection

History, physical examination and base line investigations were done. Once the provisional diagnosis of perforation peritonitis was confirmed, the patient’s APACHE II score were assessed categorically. All patients were resuscitated with IV fluids along with emendation of electrolyte imbalances. Broad spectrum antibiotics were given to all patients, GI decompression done through Ryle’s tube. Those patients who could withstand general anesthesia were managed for

exploratory laparotomy for peritoneal toilet and source control.

RESULTS

The study included 108 patients with secondary peritonitis; the study population included 80 male patients and 28 female patients. Table 1 shows gender distribution.

Table 1: Gender distribution.

Sex	No. of patients	Percentage
Male	80	74.1%
Female	28	25.9%

The mean age of the study patients was 34 years (range of 2 to 88 years old). Majority of patients were in the age group of 21-40 years, constituting 44.5%. Table 2 shows age distribution of the patients.

Table 2: Age distribution.

Age in years	No. of patients	Percentage
0-20	20	18.5%
21-40	48	44.5%
41-60	31	28.7%
61-80	6	5.5%
81+	3	2.8%

All the patients had history of pain abdomen (100%) followed by nausea/vomiting (88%), abdominal distention (80%), constipation (40%), fever (25%) and diarrhea (15%).The most common site of Pathology was Gastroduodenal (50%) followed by small bowel (jejunum/ileum) region (23%), appendix (22%) and large bowel in 5% patients. In our study Peptic perforation was the leading cause (50%) followed by appendicular perforation (22%) abdominal trauma (10%) and enteric perforation (10%) tubercular perforation (3%) gangrenous bowel (2%) malignant perforation of large bowel (2%) Meckel’s Diverticulum (1%). Major group of patients were in Apache II score of 0-10 with 42.6% of patient as shown in Table 3.

Table 3: Distribution of patient as per APACHE II score.

APACHE II Score	No. of patients	Percentage
0-10	46	42.6
11-20	36	33.4
21-30	20	18.5
31+	6	5.5
Total	108	100

Different operative procedures that are primary closure, resection and anastomosis, appendectomy with peritoneal lavage and mopping stoma formation or only

peritoneal drainage were performed according to the cause and severity of illness, as per the institutional protocols. Postoperative complications were more in patients with higher Apache II score, 6 out of 6 patients with Apache II score of above 30, developed systemic

complication (Table 4), and 100 % mortality (Table 5). Duration of hospital stay in patients with Apache II score of 11 to 20 was 20 days and above 31 Score was less 1.5 days due to early mortality (Table 6).

Table 4: Distribution of patients according to complications as per APACHE II Score.

APAC-HE II Score	No. of patients	Local complications	Systemic complications
0-10	46	17	6
11-20	36	20	14
21-30	20	15	12
31+	6	6	6

Table 5: Outcome in relation to APACHE II Score.

APACHE II Score	No. of patients	No. of survivors	No. of non survivors	Observed mortality
0-10	46	45	1	2.18%
11-20	36	29	7	19.4%
21-30	20	8	12	60%
31+	6	0	6	100%

Table 6: APACHI II Score and mean duration of hospital stay.

APACHE II Score	No. of patients	Mean duration of hospital stay (days)
0-10	46	14.8
11-20	36	20
21-30	20	12.5
31+	6	1.5

DISCUSSION

The study was done to risk-stratified the patients of secondary peritonitis so as to take appropriate steps and measures to deal with patients expected to have adverse outcome as predicted by Apache II score evaluation. Males were most commonly involved 74.1% (80) and age group 21-40 yr. was mostly involved 44.5% (48). Overall mean age of study population was 34 years. Similar results were documented by Suvadip Chakrabarti.¹⁰ The most common presentation in our study was abdominal pain 100% followed by nausea vomiting 88% and abdominal distension 80%.

These were comparable to other study done by Desa LA.¹¹ The most common etiology encountered was peptic perforation 50% followed by appendicular perforation 22%, similar results were encountered by Afridi SP.¹² Most patients were having low Apache II score; 42.6% having Apache II score 0 to 10 similar to scores seen by Agarwal A.² Local complications were encountered more in patients with low Apache II score whereas systemic complications were more common in patients with higher

Apache II score. Apache II score correlated well with the outcome; with poor outcome (higher mortality rate) seen with higher score. The duration of hospital stay was more with lower Apache II score less than 20 but less with higher Apache II score more than 20 due to associated increased mortality during early Hospital stay.

Gupta et al, in their study on 100 patients of perforation peritonitis concluded that for the prediction of death and complications in peritonitis, the physiological reserves of the patient is of great importance.⁸

In their study they reported more than 65% mortality in patient with Apache II score of more than 20 and 100% mortality rate in score more than 34. They also observed that more the Apache II scoreless is the Hospital Stay as observed with our results.

In a similar study by Similar observations were encountered by S Sahu et al, Chen FG et al, and Delibegovic S et al.¹³⁻¹⁵

CONCLUSION

APACHE II score correlated well with postoperative complications, outcome, hospital stay. However, in patients with very high Apache score more than 30, the mean duration of hospital stay is less due to associated increased mortality during early Hospital stay.

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