ORIGINAL RESEARCH PAPER

Volume-7 | Issue-12 | December-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

VALIDATING THE APACHE II SCORE IN PREDICTING THE OUTCOME OF PATIENTS WITH ACUTE PERFORATION PERITONITIS AT TERTIARY HOSPITAL

General Surgery

Dr. Koduri Vijaya Kumar M.S.(Gen), Associate Professor Of General Surgery, Osmania Medical College/ Hospital, Dr KNR University Of Health Sciences,India

Dr. Vadicharla Manjusha* M.S.(Gen), Assistant Professor Of General Surgery, Gandhi Medical College/ Hospital, Dr KNR University Of Health Sciences, India *Corresponding Author

Dr. P. Mrunalini Arun PG Y3, Gen.Surg Dept., Osmania Medical College

ABSTRACT

To evaluate the performance of APACHE-II scoring system in predicting mortality in patients with perforation peritonitits. To evaluate the APACHE II score to allow identification of high risk patients.
To confirm the predictive value of the APACHE II score .
To identify the patients using APACHE II score for intensive postoperative or ICU care.

KEYWORDS

APACHE II Score,Acute Peritonitis

INTRODUCTION:

Acute 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. 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 patients

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 [4,5,6]. The introduction of injury severity scale by Baker's et al [7] in 1974 and abbreviated injury scale [8] in 1981 successfully opened avenues from further development of severity grading systems. Many scoring systems have been designed and used successfully to grade the severity of acute peritonitis and abdominal sepsis.The most widely used index APACHE (Acute physiology and chronic Health Evaluation) was developed from a mixed group of medical and surgical patients. It has been successfully used to assess critically ill general surgical patients and also been compared with other scoring systems with good results.[4,9,10,11,12]

METHODS:

A prospective survey of 50 patients with acute generalized peritonitis due to gastrointestinal perforation was carried out in Tertiary Hospital during the period from September 2011 to September 2012.All the subjects underwent laparotomy for intestinal perforation.The case detection was done on the following criteria.

Inclusion Criteria:

1.Adult patients with features of GI perforation..
2. Patient whose plain x-ray erect abdomen showed features of air under diaphragm.
3.Patients>18 yearsof age are taken into the study.
4..Both the sexes are taken into the study.

Exclusion Criteria:

1. Patient who presented with features of peritonitis and had no evidence of perforation radiologically and per operatively i.e.,primary peritonitis .
2. Patients with post operative peritonitis as a complication of surgery.
3. Patient with esophageal perforation.
4. Tertiary peritonitis
5. Traumaticperforation
6. Peritonitis due to ruptured liver abscess,appendicular abscess.

METHODS: All patients were evaluated clinically, hematological and bio chemical investigations were carried out.

Patients were resuscitated with intravenous fluids and correction of electrolyte imbalance as indicated by the results of the electrolytes and urea..X-ray – Plain X-Ray abdomen Erect.Plain X-ray chest PA View done.

The following Acute physiological parameter of APACHE II were assessed and recorded at the admission point preoperatively. Temperature (degree centigrade),Mean Arterial blood pressure (mmHg),Heart rate, Respiratory rate (non ventilated),Serum Sodium (m eq/1),S. Potassium (meq/l) S. Creatinine (mg/dl),Hematocrit (%),White blood count (total / cm3)

HCO3 (meq/l),Arterial pH ,Partial pressure of oxygen (Po2) ,The scoring was applied in accordance with the Modified APACHE II chart, scoring the abnormality high or low levels..The scores ranged from 0 to 4 on each side of normal value. These parameters represent the acute physiological scores (APS).

Age points are as follows for adult patients :
44=0,
45-54 = 2,
55-64 = 3,
65-74 = 5,
75=6

Chronic ill health value was added if the patients has history of hepatic insufficiency or is immuno compromised points are assigned as discussed earlier .The Sum total of the APS, Age point and chronic health values is the total APACHE II Score. All the parameters were entered in the APACHE II Table .

After proper clinical assessment the patients were actively resuscitated with intravenous fluids, nasogastric aspiration, antibiotics, analgesics. A combination of ampicillin, gentamycin & metronidazole were used initially in all cases. Antibiotics were later changed according to the culture and sensitivity report. The bladder was catheterised to monitor the urine output.

After stabilising the general condition, the patients were taken up for surgery.

Surgery in the form of laparotomy was done under general or epidural anaesthesia .The appropriate incision is used depended on the suspected site of pathology with appropriate surgical procedure was performed.

Peritoneal toilet with normal saline was carried out and the peritoneal cavity drained by closed drainage system.. The abdomen was closed in

layers or by mass closure using No. 1 prolene..Post operatively nasogastric aspiration, antibiotics were continued, nutrition and electrolyte balance were maintained with intravenous fluids. Daily patients were assessed for recovery and complaints if any were recorded. Specific instruction was given to each patient on discharge, to come for periodical review regularly.

RESULTS:

Fifty consecutive cases having Acute perforative peritonitis admitted in general surgical wards during the period of October 2016 to September 2018 were studied.

Clinical diagnosis was made from history, physical examination and investigations. Depending on the general conditions of the patient, the line of management was planned.Exploratory laparatomy was performed in all cases. Pre – operative resuscitation was done before laparotomy in all cases.

Age and Sex Distribution:

The perforation was common in age group of 31-40 in our study, especially due to duodenal ulcer perforation. Male to Female ratio was 5 : 1

Table 1 : TIME OF PRESENTATION

Time in hrs	No of cases	Percentage
0-6hrs	6	12%
6-12hrs	8	16%
12-24hrs	15	30%
24-48hrs	15	30%
>48hrs	6	12%

Table 2 : SITE OF PERFORATIONS

Site of Perforation	No of cases	Percentage
Duodenum	22	44%
Stomach	6	12%
Jejunum	2	4%
Ileum	10	20%
Appendix	8	16%
Colonic perforation	2	2%

Duodenal ulcer constitutes the most common cause of gastrointestinal perforation.

75% of duodenal ulcer patients give a history of previous peptic ulcer diseases. Among the 4 gastric perforations one had malignant perforation who underwent gastrectomy later. Ileal perforations were 8 there were due to enteric fever which was subsequently proved by investigations.2 patients had jejunal perforation in this study. Appendicular perforations were seen in 7 cases. Appendix was found to be gangrenous in all cases. In our study there were two cases of colonic perforation which were due to malignancy.

CLINICAL FEATURES

Table – 3. Analysis of symptoms in relation to aetiology

No	Aetiology	Clinical features					Total No of cases
		Abdominal pain	Vomiting	Fever	Diarrhoea	Constipation	
1	Duodenal	22	14	21	2	16	22
2	Gastric ulcer	6	2	2		6	6
3	Jejunal	2	2	2		2	1
4	Ileal	10	7	10	4	5	10
5	Appendicular	8	6	8	3	3	8
6	Colonic	2	2	2		2	2
		50	33	45	9	34	50

Table 4 : Analysis of various signs in relation to aetiology

No	Aetiology	Clinical features					Total No of cases
		Tenderness	Rigidity	Free fluid +ve	Liver dullness obliterated	Bowl sounds	
1	Duodenal	22	22	20	20	19	22
2	Gastric ulcer	6	6	6	7	6	6
3	Jejunal	2	2	1	1	2	2
4	Ileal	10	10	7	5	8	10
5	Appendicular	8	7	5	3	6	8
6	Colonic	2	2	1	1	2	2
		50	49	40	37	43	50

The table 4 and 5 gives various symptoms and signs in relation to etiology.

Abdominal pain is the commonest.Vomiting was present in 36 patients -bilious in nature.Table gives various signs in relation to etiology.Rigidity was found in 98% of cases.Liver dullness was obliterated in 72% of cases. Absence of bowel sounds was seen in 86% of patients.

CONCLUSION:

APACHE II scoring predicts mortality which was significant irrespective of the aetiology.

Higher Mean scores predicted serious morbidity outcomes.

APACHE II Scores can be used easily and effectively to identify high risk patients for intensive therapy.

APACHE II Scores can be used as a tool for surgical audit and research for improving the quality of intensive care in a hospital like ours.

DISCUSSION:

Duodenal ulcer perforations were more common, in the age group 31-40, in our study when compared to Devitt Taylor and Debakey's above 60 years and 50-60 years respectively

Male : Female ratio was 5 : 1 in our study.

Table - 5

Study	M : F
Andrew M Desmond	6 : 1
Rodney Maingot	6 : 1
Our Study	5 : 1

Compared to western studies Crawford and Ellis (1985)[37] it was found that large bowel perforations in our study are lower compared to Western population.

Our study had similar distribution that of previous Indian studies Kachroo et al [38] and Sharma et al., [39] which showed common etiology being Duodenal ulcer, ileal and appendicular perforation in order of frequency.

E.- Coli was the predominant organism in culture in our study.

Morbidity was observed in 66 percent of patients, mortality was 7 in 50 i.e., 14% which is accepted mortality. Maingot et al (10-40%). Etiology wise duodenal ulcer patients had very low mortality 3 out 27, whereas colonic perforation and enteric perforation had high mortality. APACHE II Parameters have been shown to have stronger relationship to the outcome then previous grouping such as anatomy, causes, abnormality, age and chronic ill health without consideration for

systemic effects of the intra abdominal sepsis.[40]

Thus its use in this study. The APACHE II score is very popular and has been used in both surgical and non– surgical patients, it has also been validated using many patients over several years in many centers in the developed countries.[1,4,5,6,18,41]

The APACHE II score for the morbidity for the patients having severe complications like abdominal abscess, fecal fistula, wound dehiscence, were higher but were not statistically significant. This may be due to the cross sectional nature of our study and the sample size. They helped to identify high risk groups where higher complications can be expected.

In mortality, higher APACHE II Scores were noted. There was no death in scores ranging from 0-4, 5-9, 42% percent mortality in 10-14 groups and 57.2% percent in 15-20 groups.

Scores for survivors was a mean of 7.72 and a standard deviation of 3.6, and for nonsurvivors, mean of 16.14 and standard deviation of 2.96. $p = 5.79$, $p < 0.001$ which is statistically significant which compares with earlier studies by Adesunkanmi ARK, BadmusTA, Agbakwuru EA,[1,18] in adult African patients. Hence higher score indicates a need for concentration of medical services and expediting resources in treating those set of patients to reduce the morbidity and mortality.

Preoperative APACHE II scores are simple and effective method for assessing disease severity and predicting the morbidity and mortality outcome which is observed by our study.

Table – 6: MORTALITY AND MEAN APACHE II SCORES

Study	Modified APACHE II SCORES Mean	
	Survivors	Non Survivors
Adesunkanmi et al[1,18]	7.6 + 4	9.4 + 2
Our Study	7.72 + 3.6	16.14 + 2.96

REFERENCES

1. Adesunkanmi ARK, Badmus TA Agbakwuru EA, Acute Gen. Peritonitis in adult African patients, Assessment of severity using APACHE II. Ann. College of surgeonHK, 2003 : 7 : 23-8.
2. Bohnen J, Boulanger Meakins JL, Mclean PH Prognosis in Gen. Peritonitis, relation to cause and risk factors. Arch. Surg. 1983, 118 : 285-90.
3. Ponting GA, Sim AJW, Dudley, HAF, Comparision of local and systemic Sepsis in predicting survival, British J. Surg. 1987; 74 : 750-2.
4. Bion J, Outcome in Intestive care, BMJ, 1993, 307 ; 953-4.
5. Knaus WA, Drapper EA, Wagner DP, Zimmerman JE, APACHE severity of disease classification system. Crit. Care Med. 1985, 13 : 818-29.
6. Civetta JM, Hudson – Civetta SA, Nelson LD, Evaluation of APACHE II for cost containment and quality assurance. Ann. Surg. 1990, 212 : 266-76.
7. Baker SP, O'NeilB, Haddson W (u), Long WB, The injury severity score. A method for describing pattern of patients with multiple injuries and evaluation of emergency cases.J. Trauma, 1974; 14-187-96.
8. Greenspin L, Mclellan BA, Greig H, Abbrievated injury scale and injury severity score.A scoring chart J. Trauma, 1985; 25 : 60-