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A Prospective Clinical Study of Prognosis in Generalised Peritonitis by Apache II Score

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ABSTRACT

Peritonitis is the major cause for morbidity and mortality. Aim is to evaluate the incidence , risk factor, aetiology and mortality rate in generalised peritonitis in Tirunelveli Medical College Hospital , Tirunelveli by APACHE-II scoring. This prospective study includes 100 patients suffering with generalised peritonitis admitted in general surgical wards. All the patients were treated with antibiotics against aerobic and anaerobic organisms, and laparotomy was done. Males and females accounted for 86%, 14% of the cases respectively, the sex ratio being 6:1. Overall mean APACHE II Score for 100 patients was 7.8 ranging from 1 to 20. The mean APACHE II Score in expired patients was 14.8 compared to 7.1 in survivors. Duration of illness and age of patient had a great influence on mortality. APACHE II Score was a clear and significant indicator of the outcome of peritonitis.

KEYWORDS Peritonitis; laparotomy; outcome, APACHE II SCORE,

INTRODUCTION

Peritonitis is defined as diffuse bacterial infection of the peritoneal cavity occurring without loss of integrity of the digestive tract, by perforation or anastomotic disruption of the digestive tract, and in about 80 % of cases responds well to timely surgical intervention combined with appropriate antimicrobial and supportive therapy. Even though with adequate antibiotic coverage, adequate medical support peritonitis is supposed to be the dominating cause for deaths. The patients are unable to contain the infection because of impaired host defense or overwhelming infection, characterized by poor recovery despite appropriate surgical and antimicrobial treatment. Nowadays, due to life style modification, sedentary work habits, high calorie intake, consumption of alcohol and smoking, the chances of risk for mortality and morbidity has greatly increased. Various diseases can be evaluated with various clinical scaling; for example Ranson's criteria for acute pancreatitis. Similarly certain indices can be used for evaluation of generalised peritonitis, one such method being APACHE-II scoring which is more useful and suitable [6]. This helps in assessing the outcome of patients treated with peritonitis. Hence, a prospective study was conducted in Tirunelveli Medical College Hospital with an aim to evaluate the incidence of mortality rate in generalised peritonitis, implementing APACHE- II score in assessing the degree of severity of generalised peritonitis and to find out the contributing factors for deaths.

MATERIALS AND METHODS

The APACHE –II study was done in Tirunelveli Medical College Hospital, Tirunelveli. The evaluation parameters were risk factor, aetiology, APACHE- II scoring and case fatality rate. In this prospective study, the subjects were 100 patients with generalised peritonitis who were admitted in general surgical wards between 12.08. 2011 to 12.08.2013. Patient selection was done by adopting random sampling method. The selected adult patients (> 13 years of age) consisting both male and female were all established cases of peritonitis including gastric perforation, duodenal perforation, small bowel perforation, large bowel perforation, appendicular perforation, post surgical leakage. Genitourinary, gynaecological and paediatric cases were excluded from this study. All the patients were treated with antibiotics which covered aerobic and anaerobic organisms. Aetiology for generalised peritonitis was studied in 10 groups by using Meakins *et al* classification[1]. The data regarding each patient was collected using a standard proforma. Approval from ethical committee of Tirunelveli Medical College was obtained prior to the study. The time and type of procedures were recorded, as were details of antibiotic therapy, culture reports of peritoneal fluid. Onset of the presenting illness was taken as the time when patient developed acute symptoms like abdominal pain and duration of illness was taken as the time that elapsed from the onset to the commencement of surgical treatment. An APACHE-II score was computed for each patient on the day of admission before surgery.

The APACHE-II score recorded the degree of deviation from the normal of 12, routinely measured laboratory tests, physical findings, using skill from 0 to 4. The risk factors included in this study were age, duration of illness, source of infection, cause of intra abdominal sepsis and APACHE-II score. The point score was calculated from a patient's age and 12 routine physiological measurements: Temperature (rectal), Mean arterial pressure, pH arterial, Heart rate, Respiratory rate, Sodium (serum), Potassium (serum), Serum Creatinine, Serum Albumin, AaDO2 or PaO2 (depending on FiO2), Hematocrit, White blood cell count.

RESULTS

Males accounted for 86% of cases and females accounted for 14%, the sex ratio being 6:1. The maximum number of patients was in the age group of 30 – 39 years, followed by those in 40 - 49 year group as shown in Table-1.

Table -1: Age and sex distribution of cases

Age in yrs	Males	Percentage	Females	Percentage	Total
13-19	5	5.8	1	7.1	6
20-29	15	17.4	2	14.3	17
30-39	28	32.6	3	21.4	31
40-49	17	19.8	3	21.4	20
50-59	12	13.9	2	14.3	14
60-69	5	5.8	1	7.1	6
>70	4	4.7	2	14.3	6

Age of the patient and case fatality rate:

In this study, the total number of death was 10. The case fatality rate was high among the older individuals, more in 40 - 60 year age group. The cause of intra abdominal sepsis were classified into 10 groups on the anatomical and functional basis as described by Meakins and associates [1]. All the patients had generalised peritonitis and abdominal infection. 79 patients had duodenal perforation, 15 had ileal perforation, 5 patients had appendicular perforation, 1 patient had sigmoid volvulous with gangrene. There were no cases with peritonitis due to intra abdominal abscess, gall bladder pathology, pancreatic diseases, liver diseases, primary or post operative peritonitis in this study. The influence of duration of illness from the onset of symptoms like pain abdomen to the commencement of treatment had an impact on the outcome of intra abdominal sepsis. Analysis showed that those who underwent surgery after 24 hrs had mortality rate of 32.1% as compared to those who were treated before 24 hrs - 1.4%.

APACHE II score and case fatality rate:

The overall mean APACHE II Score for 100 patients was 7.8 ranging from 1 to 20. The mean APACHE II Score in patients who expired was 14.8 compared to 7.1 in survivors. The maximum overall CFR of 88.9% was seen in patients with APACHE II Score of 16 and above. P value of less than 0.05 was observed here which was significant statistically as shown in Table-2. An increase in APACHE II Score was associated with increased likelihood of mortality.

Table-2: APACHE II score and case fatality rate

APACHE II Score	No of patients		No of deaths		CFR		P
	Male	Female	Male	Female	Male	Female	
0-5	31	3	1	0	3.2	0	-
6-10	34	8	0	1	0	0	-
11-15	13	2	0	0	0	0	-
16-20	8	1	7	1	87.5	100	<0.05
Total	86	14	8	2	9.3	7	-

There were 9 patients with APACHE II Score above 15 of which 8 expired with a CFR of 87.5% where as 91 patients had an APACHE II Score less than 15 of which 2 expired with a CFR of 2.2%. This is a significant prognostic factor in patients with intra abdominal sepsis. The source of infection and case fatality rate was also studied. It showed increased mortality in patients with duodenal perforation and ileal perforation with CFR of 10.1% and 13.3% respectively. In our study, 93 patients underwent emergency laparotomy, and 7 patients were in a state of circulatory collapse and hence drainage procedure was done for resuscitation and then laparotomy was done. For 72 patients, surgical intervention was given before 24 hrs from the onset of illness in which the mortality rate was 1.4% and 28 patients for whom surgical intervention done after 24 hrs of treatment had mortality rate of 32.1%

DISCUSSION

Peritonitis is recognised as uniformly a serious condition which leads to mortality. Surgical interventions, antibiotic therapy, proper intensive care and supportive care were done to reduce the mortality in this study. The commonest causes for peritonitis were appendicular perforation, duodenal ulcer perforation and ileal perforation. The age of the patient, duration of illness, source of infection, APACHE II Scoring influenced the outcome of the patients. The diagnosis and management intra abdominal sepsis were studied and followed as per Joseph S. Solomkin *et al*. [7].

The age of the patient influences the mortality rate. In the elderly, pre existing conditions such as emphysema, diabetes, liver problems, cardiovascular and renal problems compromise the ability to overcome the superimposed challenge of acute infection [2]. In our study, the youngest patient to die of intra abdominal sepsis was 13 yrs with ileal perforation secondary to enteric fever who was hospitalized after 24 hrs of onset of illness. The oldest one to die was 70 yr with duodenal ulcer perforation. Various factors like decreased vascularity leading to decreased delivery of phagocytes, decrease in the number of mature T- Lymphocytes, decreased chemotactic and phagocytic activity of the polymorphonuclear leucocytes and hypoprotenemia could be attributed to explain the risk of death in the elderly.

Survival of the patients with peritonitis depends upon the duration of peritoneal soiling before the leak is closed surgically or spontaneously. In our study, 93 patients underwent emergency laparotomy and 7 patients were in a state of circulatory collapse, hence only drainage procedure was done. For 72 patients surgical intervention was given before 24 hrs from the onset of illness, had a mortality rate of 1.4% and 28 patients for whom surgical intervention done after 24 hrs of treatment had mortality rate of 32.1% which are comparable to the observations of Hunt [4], Bohnen *et al.* [5].

Disruption of gastrointestinal tract is the common cause of intra abdominal sepsis. In our study, the CFR in patients with peritonitis due to gastro duodenal causes was 10.1% and small bowel perforation was 13.3% where as Hau T et al. [3] showed 46% and 25% mortality.

In our study, the mean APACHE II Score estimated for assessing the risk of death in patients was 7.8 with a range of 1 to 20. The mean APACHE II Score in patients who died was 14.8 compared to 7.1% in survivors. Increase in APACHE Score is directly proportional to the mortality rate. All patients with a score above 16 died. Patients with APACHE II Score <15 had mortality rate of 2.2% compared to mortality rate of 88.9% in patients with score>15.

CONCLUSION

Duration of illness, age of patient, cause of peritonitis and source of infection had great influence on mortality in peritonitis cases. APACHE II Score was a clear and significant indicator of the outcome of peritonitis.

CONFLICT OF INTEREST : Nil.

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