



TO COMPARE THE OUTCOME IN PATIENTS WITH PERITONITIS BY MANNHEIM PERITONITIS INDEX AND APACHE II- A RETROSPECTIVE STUDY

General Surgery

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KEYWORDS

INTRODUCTION:

Peritonitis is defined as inflammation of the peritoneal cavity, caused by a number of etiological agents including bacteria, fungi, viruses, chemical irritants and foreign bodies. The sequence of both local and systemic events that occurs following the peritoneal insult represents a comparatively constant response to a variety of injurious agents. However, the clinical aspects, specifically, the management of peritonitis is influenced significantly by the etiology of the infective process.

Generalized peritonitis is a common condition with high mortality. It persists to be a major concern for doctors and their patients throughout the globe. Till about the last decade of the previous century, all forms of peritonitis were managed with a conservative approach and had a reported mortality of 90%.

There are several applications for prognostic scores in peritonitis. [6] In clinical trials, they are used to define risk, to compare treatment, to define inclusion and exclusion criteria, and to measure outcome in trials that do not involve comparisons."

The use of scores for the accurate and reliable prediction of mortality in individual patients with peritonitis has not yet been analysed fully. We have therefore carried out a study to test the two prognostic scoring systems' ability to predict the outcome (death or survival) in patients with peritonitis.

Aim:

A Retrospective Study -To predict the outcome of patients with peritonitis using the two most widely used scoring systems- MANNHEIM PERITONITIS INDEX & APACHE II.

Peritonitis is defined as inflammation of the peritoneal cavity, caused by a number of etiological agents including bacteria, fungi, viruses, chemical irritants and foreign bodies. The sequence of both local and systemic events that occurs following the peritoneal insult represents a comparatively constant response to a variety of injurious agents. However, the clinical aspects, specifically, the management of peritonitis is influenced significantly by the etiology of the infective process.

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Objectives:

- Study of the spectrum of peritonitis.
- Early prognostic evaluation of patients affected by acute peritonitis.
- Evaluation of outcome of patients with acute peritonitis with Mannheim Peritonitis Index and APACHE II.

- Evaluation of the predictive value and reliability of Mannheim Peritonitis Index and APACHE II.

MATERIALS AND METHODS

Type Of Study: A Retrospective Study

Source Of Data: Patients with acute peritonitis attending Mahatma Gandhi Medical College and Hospital; Jaipur formed the subject of the study

Period Of Study: Between November 2015 to November 2017

Sample Size: 100 Patients

Inclusion Study

- Age group - 10 years to 70 years All cases of perforation peritonitis.
- All cases of intra abdominal abscesses
- All cases of Blunt Trauma Abdomen perforation

Exclusion Criteria

Patients with DIABETES MELLITUS, IMMUNOCOMPROMISED PATIENTS

ELIGIBILITY CRITERIA FOR DATA

Diagnosis was made by an analysis of history, clinical and radiological examination, after which the patients were or were not posted for emergency laparotomy.

Once the diagnosis of peritonitis was confirmed by the operative findings of the patients, the patients were accepted for the study.

Patients that were managed conservatively were accepted if the clinical reports were suggestive of diagnoses which lead to peritonitis.

ETHICAL CLEARENCE

Two systems were used to score the patients. Mannheim Peritonitis Index:

It was developed by Wacha and Linder") in 1983. It was developed based on the retrospective analysis of data from 1253 patients with peritonitis in which 20 possible risk factors were considered. Of these 20 factors, only 8 were proved to be of Index. (Table I) These factors were classified according to their prognostic relevance and were entered into Mannheim Peritonitis predictive power.

MANNHEIM PERITONITIS INDEX

Table 1: Eight Risk Factors Of Prognostic Relevance In Mannheim Peritonitis

Study Variable	Weightage if present
Age > 50 years	5
Female Sex	5
Organ Failure (Table II)	7
Malignancy	4
Pre-operative duration of peritonitis > 24 hours	4

Origin of Sepsis - Non colonic	4
Diffuse Generalized Peritonitis	6
Exudate	0
Cloudy/ Purulent	6
Fecal	12

Index

Table II: Definition Of Organ Failure

Definition of Organ Failure

Maximal possible score is 47 and minimal possible score is zero.

Patients were divided into three categories according to Mannheim

Peritonitis Index score:

Category 1 Score less than equal to 21

Category 2 - Score between 21 & 29

Category 3-Score equal to greater than 29

Kidney	Serum Creatinine level ->177umol/L Serum Urea ->167mmol/L Oliguria - <20ml/hr Oliguria -<20 ml/hr
Lung	PO2 <50 mm of Hg PCO2>50mm of Hg
Shock	Hypodynamic or Hyperdynamic
Intestinal Obstruction	Paralytic Ileus >24hrs or Complete Mechanical Obstruction

APACHE II:

Standards for Acute Physiological And Chronic Health Evaluation Scoring Index

The APACHE II scores were calculated as per the method of Knaus

The Acute Physiological Score (APS) is based upon 12 physiological variables [Table III]. These values were scored in accordance with abnormally high or low range. The score ranges from 0 to 4 on each side of the normal value. Zero score represents a normal value; an increase to 4 indicates the extreme end of high or low abnormal levels.

APACHE II score=	Acute Physiological Score (APS)+ Age points+ Chronic Health Points (CHP)
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For each physiological variable, we included the most abnormal measurement if the test had been done more than once. The outcome of each patient was noted and compared to the initial score.

The parameters for prognosis used in this study were

a The patient was discharged alive.

b The patient died during the course of treatment.

We took both scores in each patient

a. At the time of admission.

b. After 48 hours of admission (if patient was alive)

To evaluate the outcome of patients and predictive value of both the indices, we compared the scores at the time of admission with the final prognosis of the patient.

To evaluate the reliability of the indices, we compared the scores at the time of admission, the scores after 48 hours of admission and the final prognosis of the patient.

The two scores were compared statistically and a p value <0.05 was considered significant.

-> Thus, the value of each scoring system was tested in prognosticating the outcome of patients.

Physiological Variables In As Per APS

PHYSIOLOGICAL VARIABLES	+4	+3	+2	+1	0	+1	+2	+3	+4
TEMPERATURE	>41	39-40.9		38.5-38.9	36-38.5	34-35	32-33.9	30-31.9	<29.9
MEAN ARTERIAL PRESSURE	>160	140-179	110-139		70-109		55-69		<49

HR	>180	140-179	110-139		70-109		55-69		<39
RR	>50	35-49		25-34	12-24	10-11	6-9		<5
OXYGENATION PaO2	>500	350-499	200-349		<200				
ARTERIAL PH	>7.7	7.5-7.59		7.5-7.59	7.33-7.49		7.25-7.32	7.15-7.24	<7.15
SERUM NA	>180	160-179	155-159	150-154	130-149		120-129	111-119	<110
SERUM K	>7	6-6.9		5.5-5.9	3.5-5.4		2.5-2.9		<2.5
SERUM CREATININE	>3.5	2-3.4	1.5-1.9		0.6-1.4				0.6-1.4
HAEMATOCRIT	>60		50-59.9	46-49.9	30-45.9		20-29.9		<20
WBC	>40		20-39.9	15-19.9	3-14.9		1-2.9		<1
SERUM HCO3	>52	41-51.9		32-40.9	32-40.9		18-21.9	15-17.9	<15
SERUM UREA	>15	9-14	5-9		1-4.9		<1		

DISCUSSION

Multicentric studies have confirmed that the in-patient death of patients with peritonitis still remains high. Although, it is reported to be around 19.5%, some studies show deaths as high as 60%. A variety of factors influence the end result of patients with peritonitis, range from various determinants of the disease and patient related factors to a myriad of diagnostic and surgical interventions. The end result in most of these patients is therefore relatively difficult to predict. Early evaluation of the severity and hazards of peritonitis may help in further surgical and medical management.

The different scoring systems lets the doctors evaluate the risks involved along with various diagnostic and therapeutic modalities and compare them with the final outcome of the patient. The MPI and the APACHE II systems both have their individualistic approaches in predicting the outcome.

The study was undertaken in 100 patients with peritonitis who were admitted in surgical units or ICU of Department of General Surgery, Mahatma Gandhi Hospital, Jaipur.

For these 100 patients, the mean MPI score was 21.5 at admission and 14.7 at 48 hours with a p-value of 0.000. The mean APACHE II score was 13.7 at admission and 11.9 at 48 hours with a p-value of 0.0989. This shows that APACHE II score does not change much within 48 hours of admission.

Of these, 69 patients survived till the discharge from the hospital. The mean MPI score for survivors was 19.1; and the mean APACHE II score for survivors was 10.2

The remaining 31 patients died. The mean MPI score for survivors was 26.8; and the mean APACHE II score for survivors was 21.5. Of these 31 patients, 8 patients died within 48 hours of admission.

Age and Sex: No age is bar for peritonitis to occur. Cases of perforation in newborn were reported by Zamir et al (1988) [51]

In our study, majority of patients belonged to the age group of 21 to 50 years, with a mean age of 42.1 years. There were 75% males and 25% females in the study.

Effect Of Age As A Risk Factor For Death:

John Bohnen has studied the effect of age as a risk factor for mortality and found that patients less than 50 years of age had 17% mortality while patients over 50 years of age had a mortality rate of 45%.

The strength of APACHE II is its timing and objectivity of measurement, clinical acceptance, breadth of diagnostic coverage, and robust statistical performance in predicting costs and survival for ICU patients.

In our study, both the APACHE II and MPI scores were found to be

almost accurate in predicting the outcome of patients. It was found that higher the scores of patients, higher was the mortality.

However, certain important issues were also noted with the use of the two systems. The MPI, although has an easier application and accurate in the prediction of outcome, it does not at all consider the underlying physiological derangement of the patients, which is important in the acute classification or categorization of the patients who need intensive support. score does not consider the etiology of peritonitis or the nature of peritoneal contamination, which has an important bearing on the outcome. Furthermore, the score is not as simple as the MPI; it is more extensive and needs laboratory support.

Thus, for a more distinguished forecast of outcome, it may be considered worthwhile to use the combination of the MPI together with the APACHE II score.

RESULTS:

The study was undertaken on 100 patients with peritonitis who were admitted in various units and ICU of the Department of General Surgery, Mahatma Gandhi Hospital, Jaipur between November 2015 to November 2017. The common causes of peritonitis were found to be Sub-Acute Intestinal Obstruction (23), Acute Pancreatitis (20), Intestinal Perforation (17) and Peptic Perforation peritonitis (15). While, cases of intestinal obstruction and acute pancreatitis showed relatively lesser mortalities, cases of intestinal perforation, necrotizing enterocolitis and SMA syndrome showed rather high fatalities. Most of the patients belonged to the age group 21 to 50 years with 75% males and 25% females in the study. The mean age of patients in our study was 42.1 years; the mean age for survivors was 39 years, and for non-survivors was 49.1 years. The mean length of stay of patients in the hospital was 11.1 days, while the mean stay in the ICU was 4.1 days. Higher survival rates were seen in patients who had a lesser than mean stay in ICU.

For all patients, Mannheim Peritonitis Index Score was calculated at admission as well as at 48 hours. The results showed that with increase in MPI score there was increased mortality. There was also a significant change in the MPI scores of admission and at 48 hours of admission. Similarly, for all patients, APACHE II score was calculated at admission as well as at 48 hours. The results showed that with increasing APACHE II score mortality increased. However, there was no significant change in the APACHE II scores of admission and at 48 hours of admission.

Our results summarized that, although, the MPI score is easier to apply and calculate, the APACHE II score showed a more accurate prediction of mortality.

In conclusion, dividing the patients into different risk groups is advantageous to formulate a specific plan of treatment for the patients with generalized peritonitis. The management can be made effective by ideal ICU supportive care whenever needed, along with a customized choice of surgical intervention considering the theme of 'better to open than to wait and watch', leading to a better forecast of the final outcome of the patient. Also, dividing patients into different risk groups helps in subsequent clinical research by comparing therapeutic interventions in similar patients.

Of the two scoring systems evaluated, the APACHE II seems to be better suited to achieve these goals, but a combination of both scores can be a better index to evaluate the prognosis and choose the optimum surgery.

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