

Original Research

To determine the mannheims peritonitis index in patients with peritonitis

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ABSTRACT:

Aim: To determine the Mannheims Peritonitis Index in patients with peritonitis. **Material and methods:** Surgery and operational findings are used to diagnose peritonitis. Thus, a method of sampling that did not include a random selection process was adopted. The research included all patients with peritonitis caused by hollow viscous perforation who were seen at our institution throughout the study period. Primary and tertiary peritonitis patients were not included in the research. Patients are sent for emergency laparotomy once a diagnosis is reached by a combination of patient history, physical examination, and radiology report findings. The individual score of each parameter is added to calculate Mannheim peritonitis index score of each case. Patients were divided into three categories according to the score: Score less than 21, Score between 21 to 29 and Score more than 29. **Results:** A total of 100 patients constituted the study group. In our study 20(20%) patients origin of sepsis was colonic while 80 (80%) patients origin of sepsis was non colonic. In 42(42%) patients total MPI score was less than 21, while 37(37%) patients total score was 21–29 and it was more than 29 in 21(21%) patients. In our study out of 100 patients with peritonitis, 16 i.e. 16% patients expired. **Conclusion:** We conclude that MPI is a trustworthy and easy reference for assessing the probability of mortality in patients with peritonitis. Since the Mannheim peritonitis index varies from ours in two areas—female sex and non-colonic origin of sepsis—we argue that further research is needed to include the colonic origin of sepsis and to exclude the female sex as predictors of unfavourable outcome.

Keywords: Mannheim, Peritonitis, Index, Study, Prognostic

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INTRODUCTION

Inflammation of the peritoneum, the thin membrane that covers most of the organs in the abdomen and borders the inner wall of the abdomen, is known as peritonitis. It is possible for an infected or noninfectious process to cause either a localised or systemic form of peritonitis. One of the most frequent conditions responded to by a surgeon on emergency duty is peritonitis caused by hollow viscus perforation, which may be fatal if left untreated. A number of variables increase its likelihood, including *Helicobacter pylori* infection, nonsteroidal anti-inflammatory drug (NSAID) usage, enteric fever, and others. Different causes call for different approaches, from emergency surgery in some circumstances to more conservative care in others. Every surgeon has difficulty in making a proper diagnosis and caring for patients with this condition. Peritonitis prognosis and outcome are affected by a complex interplay of patient- and disease-specific variables, as well as

diagnostic and therapeutic approaches. Classifying patients into risk categories would aid in prognosis, ICU patient selection, and operational risk assessment, all of which would aid in deciding what kind of operating treatment should be performed (e.g., damage control vs. definitive). There are a number of different grading systems that have been used to determine the severity of peritonitis and predict how it will progress. Two distinct categories emerge when classifying these systems. Disease-independent scores: such as the Acute Physiology and Chronic Health Evaluation II (APACHE II), the Simplified Acute Physiology Score II (SAPS II), the Sepsis Score, and the Physiological and Operational Severity Score (POSS) for counting mortality and morbidity in critically ill patients who need intensive care unit (ICU) care (POSSUM). Specific peritoneal inflammation indices, include the Mannheim peritoneal inflammation index (MPI) and the altona peritoneal inflammation index (PIA) version II.¹

Patients lives might be saved to some extent by risk categorization, preferred treatment, and surgical audit if scoring systems were used.¹ Despite the existence of a plethora of complicated and sophisticated scoring systems, each one has its own set of problems and restrictions. The statistical analysis behind the factors chosen and the relative weights supplied are frequently derived from studies of large databases of patients treated in the early 1980s in the United States. The Indian people may not find them to be universally useful. Wacha et al.² created the Mannheim peritonitis index (MPI). Based on a meta-analysis of 8 characteristics having prognostic importance, it was constructed based on data from 1253 patients with peritonitis.

Billing et al. conducted a thorough examination of MPI at 7 different locations and compared their findings. In order to determine the validity and predictive abilities of the MPI across various groups, Billing et al. studied data from 2003 patients from 7 sites in 3 European nations. Risk factor prevalence was significantly different amongst the categories. With a score of 26, the sensitivity was 86% (range: 54-98), and the specificity was 74%. Predictive reliability was 83% (range 70-94), while accuracy was 83% (range 70-94). The overall death rate was 2.3% (range: 0-11) for patients with scores 21, and 3.1% (range: 21-35). 22.5% (from 10.6% to 50%) and 59.1% (or more) if you get a score of 29 or higher. Variable (from -41 to +87).³

Given its reasonable specificity and sensitivity, MPI seems to be more useful than competing scoring systems. When compared to alternative methods of scoring, it saves time and money. It is a perfect scoring index for usage even in a basic health care setting since it does not need the use of complex investigations or diagnostic equipment. When conventional critical care options are few and beyond of reach for the vast majority of the population, as they are in India, MPI may be a lifesaver.

METHODS AND MATERIALS

This study was done in the department of surgery after taking the permission from the institute. Surgery and operational findings are used to diagnose peritonitis. Thus, a method of sampling that did not include a random selection process was adopted. The research included all patients with peritonitis caused by hollow viscous perforation who were seen at our institution throughout the study period. Primary and tertiary peritonitis patients were not included in the research. Patients are sent for emergency laparotomy once a diagnosis is reached by a combination of patient history, physical examination, and radiology report findings. It was first created in 1983 by wacha and linder.⁴ The predictive ability of these characteristics led to their categorization. Recent perforations without secondary infections were categorised as having clear bile collections. In cases of traumatic peritonitis, a sample of fresh seroheorrhagic material is considered conclusive.

Table 1: Mannheim peritonitis index score

Study variable	Adverse Points	Factor	Favourable factor	Points
Age	>50 yrs	5	< 50 yrs	0
Sex	Female	5	Male	0
Organ failure	Present	7	Absent	0
Malignancy	Present	4	Absent	0
Evolution time	>24 hrs	4	<24 hrs	0
Origin of sepsis	Non- colonic	4	Colonic	0
Extension of peritonitis	Generalized	6	Localized	0
Character of exudates	Purulent	6	Clear	0
	Fecal	12		

The individual score of each parameter is added to calculate Mannheim peritonitis index score of each case. Patients were divided into three categories according to the score:⁴

1. Score less than 21
2. Score between 21 to 29
3. Score more than 29

RESULTS

A total of 100 patients constituted the study group. The criteria mentioned in materials and methods were followed and results noted. Total no. of male patients in the study was 70 i.e. 70% while female patients accounted for 30 i.e. 30% in the study. Most number of patients had duodenal perforation 45 (45%) followed by ileal perforation 24(24%), colonic,

appendicular and gastric perforation were 13(13%), 10(10%) and 8(8%) respectively. The procedure performed was exploratory laparotomy with omental patch repair in 55cases (55%), primary closure in 25 cases (25%), Resection and anastomosis in 14(14%) cases and appendectomy in 6 Cases (6%). In our study 47 (21.7%) patients presented within 24 hours and 170 (78.3%) presented after 24 hours after onset of peritonitis. In our study 20(20%) patients origin of sepsis was colonic while 80 (80%) patients origin of sepsis was non colonic. In 42(42%) patients total MPI score was less than 21, while 37(37%) patients total score was 21–29 and it was more than 29 in 21(21%) patients. In our study out of 100 patients with peritonitis, 16 i.e. 16% patients expired.

Table 2 Age and gender distribution

Gender	Number	%
Male	70	70
Female	30	30
Age		
Below 20	6	6
20-30	15	15
30-40	20	20
40-50	40	40
Above 50	19	19

Table 3: Correlation of sex with incidence of mortality.

			Discharged		death		x ²	P value
Male	70	70	58	82.86	12	17.14	0.32	.19
female	30	30	26	86.67	4	13.33		

Table 4: Correlation between origin of sepsis (colonic/non colonic) with incidence of mortality

			Discharged		death		x ²	P value
Non colonic(n)	80	80	67	83.75	13	16.25	5.44	.01
Colonic (n)	20	20	17	85	3	15		

Table 5: Distribution of MPI variables and outcome of patients

Parameter		Total	Discharge	Death	P value
Age	Above 50	19	15	4	0.001
Sex	Female	30	27	3	0.003
Organ Failure	Present	15	4	11	0.005
Malignancy	Present	12	4	8	0.004
Evolution Time	>24 hrs	14	8	4	0.002
Origin of Sepsis	Non- colonic	13	10	3	0.003
Extension of Peritonitis	Generalized	15	8	7	0.004
Character of exudates	Purulent Fecal	15	13	2	0.005

Table 6: Correlation of MPI score with incidence of mortality.

MPI	Total	Discharged	Death	Mortality according to MPI	X ²	P value
below 21	42	42	0			
21-29	37	35	2	12.50%	121.05	0.001
Above 29	21	7	14	87.50%		

DISCUSSION

One hundred people participated in the research. The ages of the participants vary from 12 up to 77. The study population had a mean age of 45.87, with the majority of patients (about 40-50 years old, or 40% of the total) falling into this age range. Over-60s had the greatest death rate, followed by those in their forties and fifties. The youngest age group, under 20 years old, had the lowest death rate, followed by the oldest, age 30 and beyond.⁵ Our research indicated a statistically significant p 0.001 link between being beyond the age of 50 and the risk of dying. Similar to the results found by Dawson JL, et al., we found that males were more likely to suffer from duodenal perforation, which explains the higher frequency of males in our research.⁶

Our study's p value of 0.003 for the sex-mortality connection is statistically non-significant and demonstrates a different outcome with MPI compared to Cook TM et al.⁷ Our research found that 20% of patients (20 people) had a colonic origin of sepsis,

whereas the other 80% had a non-colorectal origin of sepsis. The percentage of patients whose sepsis originated in the colon ranged from 12.64 percent in a research by Rodolf L.⁸ 3.76 percent in a study by Jhobta RS.⁹ Our research's p value of 0.01 for the association between sepsis origin (colon/non-colon) and death rate is statistically inconclusive and displays divergent findings from MPI's study (p = 0.03). Feculent exudates and a severe type of peritonitis characterise the presentation of a colonic perforation. Our dataset, like that of Cecilie Svanes, showed an upward mortality curve.¹⁰ While other characteristics exhibited statistical significance in our analysis, we did not find an association between female sex and non-colorectal aetiology of sepsis.¹¹⁻¹³ Patients with an MPI value of >29 had an 87.50% death rate, whereas those with an MPI score of 21 had a 0% mortality rate (p0.001). The Mannheim peritonitis index is an individual's prediction for peritonitis, and it is a prognostic indicator with good accuracy and is relatively simple to record.^{13,14}

CONCLUSION

Patients with peritonitis may benefit from using the Mannheim peritonitis index to assess the overall study group result. With the exception of the non-colon origin of sepsis in peritonitis and female sex, all of the MPI factors of unfavourable outcome, including the presence of organ failure, time elapsed > 24 hours, presence of malignancy, age >50 years, and generalised extension, behaved as predicted. The presence of feculent exudates, which is more prevalent in cases of sepsis originating in the colon, has been linked to a worse prognosis. The female gender was linked to more positive outcomes than the male gender. The MPI is among the simplest scoring systems available, allowing the surgeon to quickly and simply assess the likelihood of adverse outcomes before proceeding with the operation. Each hospital has to have its own unique set of MPI cutoff criteria. The MPI's ease of use makes it a good choice for hospitals that are severely understaffed and underequipped. We conclude that MPI is a trustworthy and easy reference for assessing the probability of mortality in patients with peritonitis. Since the Mannheim peritonitis index varies from ours in two areas—female sex and non-colonic origin of sepsis—we argue that further research is needed to include the colonic origin of sepsis and to exclude the female sex as predictors of unfavourable outcome.

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