A Study on Mannheim Peritonitis Index in Peritonitis Individuals from a Tertiary Health Care Setup.

N Durga Prasad[1], Kamadi Ramarao[2], P. Anusha[3], K. Sailaja[4]

[1]Associate Professor, Department of General Surgery, Government Medical College, Eluru.

[2]Associate Professor, Department of General Surgery, Government Medical College, Eluru.

[3]Assistant Professor, Department of General Surgery, Government Medical College, Eluru.

[4]Associate Professor, Department of General Surgery, Rangaraya Medical College, Kakinada.

Abstract

Introduction: The Mannheim Peritonitis Index (MPI) stands out as a precise scoring system with high accuracy, offering a convenient means to predict the individual prognosis of peritonitis patients. The objective of this study was to assess the effectiveness of the MPI in predicting morbidity and mortality among patients with peritonitis.

Methods: It was a prospective research conducted in government Medical College, Eluru. Study was conducted for a period of 8 months, from January to August 2021. Study protocol was approved by Institutional ethical committee. An informed written consent was taken from all the study participants. The study included patients of both gender, >18 years admitted to surgical wards and SICU with secondary peritonitis, encompassing both local peritonitis (LP) and general peritonitis (GP), throughout the study period. Detailed clinical history was collected, findings were recorded. After clarifying all the doubts MPI was calculated as per the standard and categorised to <21, 22 – 29 and >30. All the study members underwent laparotomy, antimicrobials were given for 10 – 14 days as protocol. Chisqaure test was used for statistical analysis and P <0.05 were considered to be statistically significant.

Results: Total 98 members were included, the male female ratio was 1.43. Total 48 (49%) LP cases were detected, appendicitis was found to be the leading cause for the inflammation. MPI scores wise, 59.3% were in <21, 26.5% in 21 – 29 and 14.3% in >30, maximum deaths were in >30 group; statistically there was significant difference.

Conclusion: Patients with MPI scores below 21 exhibited a favorable prognosis, with a 0% mortality rate. Scores ranging from 22 to 29 were associated with high morbidity and mortality. In cases where scores were ≥ 30, the mortality rate peaked.

Keywords: peritonitis, Inflammation, Mannheim Peritonitis Index, study

Introduction

Emergency surgical admissions worldwide often result from secondary peritonitis and complicated intra-abdominal infections, leading to substantial mortality and morbidity; mortality rates range between 12 to 41%. In the majority of cases, the essential therapeutic approach involves surgical intervention to establish source control. [1] Acute abdomen often arises from peritonitis, which can manifest as either localized or generalized inflammation.

The ailment has likely existed since the dawn of humanity. However, advancements in diagnostic techniques, including sophisticated radiological investigations, and progress in treatment strategies such as the development of more potent antibiotics, improved fluid management, and enhanced parenteral nutrition, have contributed to a reduction in complication rates in peritonitis cases. [2]

The Mannheim Peritonitis Index (MPI) stands out as a precise scoring system with high accuracy, offering a convenient means to predict the individual prognosis of peritonitis patients. [3,4] Additionally, it serves as a dependable tool for assessing risks and classifying patients with peritoneal inflammation. This supports the implementation of early intensive management for improved patient outcomes.

The objective of this study was to assess the effectiveness of the MPI in predicting morbidity and mortality among patients with peritonitis admitted to a tertiary care hospital.

Methods:

It was a prospective research conducted in government Medical College, Eluru. Study was conducted for a period of 8 months, from January to August 2022. Study protocol was approved by Institutional ethical committee. An informed written consent was taken from all the study participants. The study included patients of both gender, >18 years admitted to surgical wards and SICU with secondary peritonitis, encompassing both local peritonitis (LP) and general peritonitis (GP), throughout the study period. Excluded from the study were patients with primary peritonitis, spontaneous bacterial peritonitis, pancreatitis, or intra-abdominal sepsis related to peritoneal dialysis and non cooperative members

After recruiting the participant in the study, detailed clinical history was collected. All the findings were recorded in the study proforma. The study was clearly explained in the local language. The participants were allowed to ask doubts. After clarifying all the doubts beyond the knowledge attempted for blood sample collection and different blood parameters and MPI was calculated as per the standard and categorised to <21, 22 – 29 and >30. [5] All the study members underwent laparotomy, antimicrobials were given for 10 – 14 days as protocol.

The recommendation included the prompt removal of non-essential catheters. Early patient mobilization played a crucial role in preventing deep vein thrombosis and promoting the overall well-being of the patient. Additionally, early initiation of enteral feeding was advised, offering the dual benefits of enhancing the sense of well-being and restoring gut flora. Patient follow-up continued until either discharge or death.

Statistical Analysis:

The data were analysed using SPSS version 21. It was presented in mean and percentage. Chisqaure test was used for statistical analysis and P <0.05 were considered to be statistically significant.

Results:

Total 98 members were included, gender wise 59 (60.2%) were male and the male female ratio was 1.43. Total 48 (49%) LP cases were detected and the rest were GP. In this study appendicitis was found to be the leading cause for the inflammation and gastric perforation was the lowest (Table 1). MPI scores wise, 59.3% (58) were included in <21, 26.5% (26) in 21 – 29 and 14.3% (14) in >30. Maximum deaths were in >30 group; statistically there was significant difference (Table 2).

Table 1: Cause for peritonitis among the study members

S. No.	Cause	Number	%
1	Appendicitis	45	46
2	Duodenal perforations	40	41
3	Colonic perforations	6	6.2
4	Ileal perforations	5	5.1
5	Gastric perforations	2	2.1
Total		98	100

Table 2: Correlation between survival and MPI score among the study members; n (%)

MPI score	Survival	Death	Total
<21	58 (59.2)	0	58 (59.3)
21 – 29	20 (20.4)	6 (6.1)	26 (26.5)
>30	6 (6.1)	8 (8.2)	14 (14.3)
Total	84 (86)	14 (14.3)	98 (100)
Statistical analysis	Ψ^2 value = 27.183; P value = 0.00000125		
	Statistically significance		

Discussion:

Perforation peritonitis stands out as a prevalent cause of surgical abdomen. Despite significant advancements in diagnosis and early aggressive medical and surgical management, the prognosis for patients with peritonitis and multi-organ dysfunction remains grim. The MPI, which incorporates single one-time investigations at presentation and accounts for intraoperative findings, emerges as an attractive option for optimizing the allocation of limited resources.

Out of the 98 (100%) study members, gender wise 59 (60.2%) were male and the male female ratio was 1.43. male predominance was reported in the literature also but the cause was not mentioned. [3, 6,7] Total 48 (49%) LP cases were detected and the rest were GP. In another Indian study, the incidence was reported to be 48% and 52%, respectively. [8] Research consistently indicates that peritonitis primarily manifests as a diffuse type. [9, 10] Diffuse peritonitis is linked with a heightened inflammatory response, paving the way for the development of

sepsis and multiorgan failure. The localization of peritonitis is considered the body's defense mechanism, potentially leading to abscess formation. In 50% of cases, purulent exudate was observed, while 25% each presented with clear and fecal exudate.

Similar to the literature, here also appendicitis was the leading cause for the inflammation (Table 1). [11] MPI scores wise, 59.3% (58) were included in <21, 26.5% (26) in 21 – 29 and 14.3% (14) in ≥30. Maximum deaths were in ≥30 group; statistically there was significant difference (Table 2). The MPI employs single one-time investigations at the initial presentation, coupled with proper recognition of intraoperative findings. This characteristic enhances its attractiveness for the efficient allocation of limited resources. The mortality demonstrated a consistent rise with an escalation in MPI score, aligning with findings reported in studies by Barrera et al. [10] and Sharma et al. [13].

Patients with MPI scores below 21 exhibited a favorable prognosis, with a 0% mortality rate. Scores ranging from 22 to 29 were associated with high morbidity and mortality. In cases where scores were ≥ 30, the mortality rate peaked. However, long term studies is recommended.

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