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Pattern of Mortality in Peritonitis Patients with different Mannheim Peritonitis Index Categories

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ABSTRACT

Background: Peritonitis caused by hollow viscus perforation is a frequent surgical emergency. Every surgeon has the task of accurately diagnosing and managing this condition. This resulted in the creation of illness severity grading systems that would help with care and accurately forecast future outcomes. **Objective:** To evaluate Mannheim Peritonitis Index in predicting the mortality among patients with peritonitis and to determine the pattern of mortality in peritonitis patients with different MPI categories. **Methodology:** This descriptive case series was conducted in department of General Surgery, Doctor Faisal Masood Teaching Hospital, Sargodha. 140 individuals with peritonitis due to hollow viscus perforation were assessed. MPI was measured upon admission and patients were divided into three groups depending on their MPI scores. The mortality rate was computed for each group. The data is analyzed with SPSS version 25.0. The Chi-square test is used to compare results. A P value of less than 0.05 is deemed statistically significant. **Results:** The mean age of patients was 41.94 ± 10.43 years with male majority (72.2%). Site of perforation in 26.8% patients was appendix followed by ilium in 20.6%, stomach in 16.5%, duodenum in 15.5%. Mean MPI score in our study was 23.31± 8.31. There were eighteen deaths (12.9%) in our study. The rate of mortality was 10(7.1%) patients in category III and compared to 8(5.7%) and 0% in patient category II and category I. **Conclusion:** MPI scoring system accurately predicts morbidity and death in individuals with peritonitis. The MPI scoring system is a simple and effective technique for assessing such individuals, and it may be used to guide patient treatment decisions after the ultimate operation is completed. It aids in the identification of high-risk patients.

INTRODUCTION

Peritonitis is defined as any type of peritoneal inflammation. Peritonitis due to hollow viscus perforation is a prevalent abdominal emergency encountered by general surgeons worldwide[1]. Despite recent breakthroughs in antibacterial medicines and supportive treatment, the fatality rate from peritonitis remains unacceptable. This can be attributable to a variety of risk factors, including H Pylori infection, NSAID usage, enteric fever, and many more. Its causes range from those need rapid surgical intervention to those requiring cautious care[2]. Causes range from requiring prompt surgical intervention in some cases to demanding cautious care in others. The prognosis is still dismal despite advancements in critical care, diagnosis, and therapy[3]. The combination of several factors, especially those connected to the patient, the illness, and the diagnostic and treatment processes, determines the prognosis and result of peritonitis[4]. Classifying patients into distinct risk categories would help prognosticate the result, choose patients for intensive care, and evaluate operational risk, hence assisting in choosing the type of the operating technique[5, 6].

For predicting the severity of the condition, numerous rating systems have been created. The Mannheim Peritonitis Index (MPI) is a particular score that has high accuracy. Therefore, it gives a simple technique to forecast the individual prognosis of peritonitis patients[7]. MPI, established by Wacha and Linder in 1983, comprises eight clinical, biochemical, and pathological risk indicators and provides a very uncomplicated technique of evaluating and categorizing patients[8]. Karki et colleagues conducted research to test the MPI score for predicting morbidity and death in patients with peritonitis caused by hollow viscus perforation. Total mortality was 9%. MPI values of < 21,

21-29, and ≥ 30 resulted in 0%, 14%, and 46% death, respectively[9].

The purpose of this study was to assess the MPI's ability to predict mortality in patients with peritonitis. MPI is a particular score with excellent precision. Consequently, it provides simple technique for estimating each patient's unique prognosis for peritonitis. This simple grading method enables the surgeon to readily assess outcome risk. Pakistan lacks data on diagnosis accuracy and fatality rates. As a result, a scoring approach was required to forecast mortality and make treatment decisions using limited investigative modalities.

METHODOLOGY

This Descriptive case series was performed in department of General Surgery, Doctor Faisal Masood Teaching Hospital, Sargodha. Patients of both genders , 18-70 years of age with diagnosis of peritonitis due to hollow viscous perforation who were later confirmed by intra operative finding were included. The sample size of 140 is calculated by WHO sample size calculator at 5% level of significance= 5%, 14%[7] mortality in MPI score 21-29. While patients with patients with primary peritonitis, SBP and pancreatitis or intra-abdominal sepsis due to peritoneal dialysis were excluded. The study was completed in the period of six months starting from December 2023 to May 2024. It was started after the approval of the study from institutional ethical review committee. Peritonitis was detected in individuals who had clinical suspicion and investigatory evidence to support the diagnosis of peritonitis due to hollow viscous perforation, which was later confirmed by intraoperative findings. MPI was determined at admission based on a thorough history and physical examination. All patients had laparotomy and were treated based on the etiology. Following surgical treatments, antimicrobial therapy, vasoactive medications, resuscitation, and ICU care were administered as needed. Patients were tracked until discharge or death. Patients were divided into three categories (score < 21, 22 - 29, and ≥30) based on MPI scores. The mortality rate was computed for each group. Data is analyzed using SPSS version 25.0. Chi-square test is applied to compare outcome. P value less than 0.05 is considered as significant.

RESULTS

The mean age of patients was 41.94 ± 10.43 years ranging from 19 to 67 years and majority of patients (43.6%) belonged to age group of 41- 50 years. There was male preponderance (70%). Site of perforation in 28.6% patients was appendix followed by ilium in 20%, stomach in 17.5%, duodenum in 13.6% as shown in table 1.

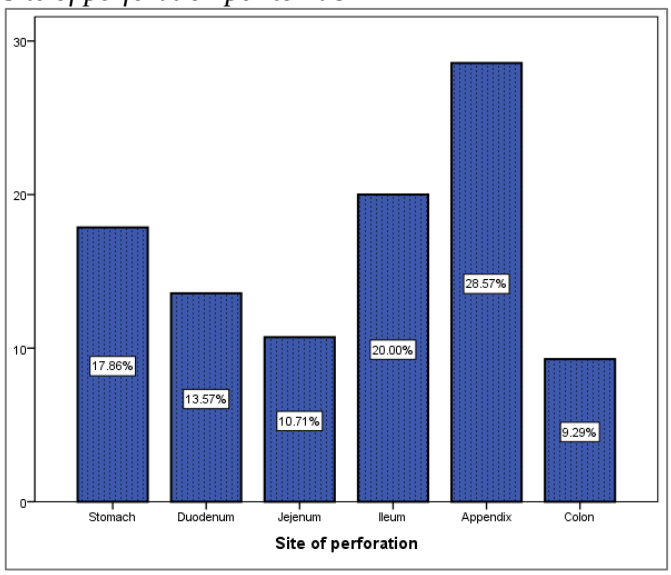
Table 1

Demographic and Clinical Features of Patients

		Frequency	Percent
Gender	Male	98	70.0
	Female	42	30.0
Age Groups	≤20 Years	5	3.6
	21-30 Years	12	8.6
	31-40 Years	42	30.0
	41-50 Years	61	43.6
	>50 years	20	14.3
Site of perforation	Stomach	25	17.9
	Duodenum	19	13.6
	Jejunum	15	10.7
	Ileum	28	20.0
	Appendix	40	28.6
	Colon	13	9.3
Total		140	100.0

Figure 2

Site of perforation peritonitis



The mean MPI score in our study was 23.31± 8.31. There were eighteen deaths (12.9%) in our study. MPI score was analyzed with the mortality and showed that number of mortality was 10(7.1%) patients in category III and compared to 8(5.7%) and 0% in patient category II and category I. as shown in table 2.

Table 2

Outcome of patients according to MPI variables

	Outcome		Total	P Value
	Discharged	Death		
Category I	64	0	64	0.000
	45.7%	(0.0%)	45.7%	
Category II	46	8	54	
	32.9%	5.7%	38.57%	
Category III	12	10	22	
	8.6%	7.1%	15.71%	
Total	122	18	140	
	100.0%	100.0%	(100.0%)	

DISCUSSION

Among surgical emergencies, perforation peritonitis is the most common. The outcome will depend on timely surgery, good preoperative care, and sufficient

postoperative care. Critically ill patients receive better care when the severity of their peritonitis is graded. The MPI is a customized score with exceptional accuracy and a straightforward method for handling clinical data, making it possible to estimate each patient's unique prognosis for peritonitis.[10]. The aim of this study was to evaluate MPI in predicting the mortality among patients with peritonitis.

The mean age of patients was 41.94 ± 10.43 years. There was male preponderance (70%). In terms of demographics, our study's findings are similar to those of previous published series[2, 4, 7, 9]. There were eighteen deaths (12.9%) in our study. Rate of mortality was 10(7.1%) patients in category III and compared to 8(5.7%) and 0% in patient category II and category I. The results are in accordance with other studies. Mortalities in various research range from 6.4% to 17.5%[11, 12]. In one research, MPI scores of < 20, 21-29, and ≥ 30 had death rates of 0%, 14%, and 46%, respectively, whereas overall mortality was 9%[9]. A Study from Nepal had an overall mortality rate of 8.2%; which is similar to other studies[7] but in contrast to studies in western countries which report much less mortality[13]. The mortality rate in another study was 8.2% (6 patients)[14]. Mortality in patients with MPI score < 21 was 0%, 21-29 was 4.3% and >29 was 53.84%[15].

In a study mortality rate was 40% in high-risk group (MPI score >29). There was no mortality in low-risk group (MPI score <21). Mortality rate was 5.26% in intermediate risk group[16]. When the MPI score for each group was used to compute the death rate, it was discovered that as the MPI score increased, so did the mortality rate[17]. This is consistent with research by Qureshi et al. that found that when MPI score rose, the death rate rose as well. [18]. The maximum level of accuracy was provided by an MPI score of 25. Yoshiko et al.'s study revealed that patients with MPI scores greater than 26 had a 28.1% death rate[19]. According to a recent South Indian study, patients with an MPI score of 26 or above had a death rate of 29.4%. Additionally, the death rates for MPI values of < 20, 21–29, and ≥ 30 were 5%, 14%, and 50%, respectively.[20]. Increasing MPI scores were found to be connected with a worse prognosis and so need active treatment[9].

CONCLUSION

MPI scoring system accurately predicts morbidity and death in individuals with peritonitis. MPI scoring system is a simple and effective technique for assessing such individuals, and it may be used to guide patient treatment decisions after the ultimate operation is completed. It aids in the identification of high-risk patients.

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