

A Study on Clinical Assessment of Peritonitis using Mannheim's Peritonitis index

H Suresh Clement¹, Y Vinay Kumar Reddy², S Ramchander³, P Vamshi Bharath⁴

¹Associate Professor, ³Professor, ⁴Postgraduate Student, Department of General Surgery, Prathima Institute of Medical Sciences, Karimnagar, Telangana, India.

²Second year resident, Department of Urology, Gandhi Medical College, Secunderabad, Telangana.

Address for Correspondence: Dr H. Suresh Clement, Associate Professor, Department of General Surgery, Prathima Institute of Medical Sciences, Karimnagar. Telangana, India.

E-mail : dr.sureshclement@gmail.com

ABSTRACT

Introduction: The incidence of secondary peritonitis is decreasing in many parts of the world. However, in India, it remains the most common cause of intra abdominal sepsis with unacceptably high mortality.

Aims & Objective: Assessment of prognosis in patients of peritonitis using Mannheim's Peritonitis Index.

Materials & Methods: A total of 60 cases studied in Prathima Institute of Medical Sciences, Karimnagar as a Prospective observational study with patients who were included in the study were those who had clinical symptoms and signs like pain abdomen, distension, vomiting, fever, tenderness, guarding, rigidity, absent bowel sounds and obliteration of liver dullness.

Results: Age appears to be a significant prognostic index with mean age of all patients was 37.25yrs, Mean age of survivors 32.17yrs and Mean age of non survivors is 53.16yrs.

Conclusion: Mannheim Peritonitis Index is a specific, simple, reliable and accurate index in assessment of prognosis in patients of peritonitis and it shows significantly high mortality when the score is > 29

Keywords: Mannheims peritonitis index, Acute physiological and chronic health evaluation score, Membrane attack complex, Intracellular adhesion molecules, Vascular cell adhesion molecules

INTRODUCTION

Despite aggressive surgical techniques the prognosis of peritonitis and intraabdominal sepsis is still poor, especially when multi-organ failure develops. The outcome of an abdominal infection depends on the complex interaction of many different factors and the success obtained with the early onset of specific therapeutic procedures. The outcome also depends upon exact recognition of the seriousness of the

disease and an accurate assessment and classification of the patient's risks.

In the recent past, many scoring systems have been developed for assessing risk of mortality in peritonitis, nevertheless excellent results have been achieved with the Mannheim Peritonitis Index (MPI) which was developed by Wacha and Linder in 1983.

These reproducible scoring systems that allow a surgeon to determine the severity of the intraabdominal infection are essential to:

- 1) Ratify the effectiveness of different treatment regimens.
- 2) Scientifically compare surgical intensive care units.
- 3) Help indicate individual risk to select patients who may require a more aggressive surgical approach.
- 4) Be able to inform patient's relatives with greater objectivity¹.

The present study is done to assess the prognosis of patients of peritonitis using Mannheim's Peritonitis Index.

MATERIALS AND METHODS

The Prospective observational study with a total of 60 cases between age of 13 and 83 years and both males and females were included in the study from November 2012 to September 2014 at Prathima institute of medical sciences, Karimnagar. The patients who were included in the study were those who had clinical symptoms and signs like pain abdomen, distension, vomiting, fever, tenderness, guarding, rigidity, absent bowel sounds and obliteration of liver dullness. Only cases of secondary peritonitis were included in the study and peritonitis due to other causes like Primary peritonitis, Post operative peritonitis, pancreatitis — excluded from study.

The Statistical significance (two tailed P value) calculated by Fischer's exact test in 2x2 contingency table and Chi square test with degree of freedom 2

Table 1: Mannheim's Peritonitis Index (mpi)

Criteria used are :		
Parameter	Finding	Points
Age	>50	5
	<50	0
Gender	Female	5
	Male	0
Organ failure	Present	7
	Absent	0
Presence of malignancy	Present	4
	Absent	0
Preoperative duration for >24hours	Present	4
	Absent	0
Primary focus	Non colonic	4
	Colonic	0
Diffuse generalised peritonitis	Present	6
	Absent	0
Nature of exudate	Clear	0
	Viscous Purulent	6
	Feculent	12

Criteria for organ failure for kidney when creatinine > 2mg/dl, Blood urea >100mg/dl, Oliguria<20ml/hr. Criteria for organ failure for lung, PaO₂ <50mmHg, PaCO₂ >50mmHg.

Criteria for shock if the patient is hypodynamic or hyperdynamic and criteria for intestinal obstruction if Paralysis > 24hours or Complete mechanical ileus. Organ failure is considered to be present if the above criteria are met. MPI = SUM of points parameters present (Table no 1)

Interpretation: Maximum score is 47 and a Minimum score is 0.

An MPI Score >26 indicates a very high mortality rate may be expected.

RESULTS

Duodenal ulcer perforation occurred in 42 cases which is 70% of the cases studied, with chances of death about 22.22%. Appendicular perforation occurred in 13 cases which is 21.6%, with chances of death about 7.69%. Small bowel perforation occurred in 2 cases which is 3.3%, with chances of death about 8.69%. Appendicular perforation occurred in 13 cases which is 21.6%, with chances of death about 7.69%. Gastric perforation occurred in 1 case which is 1.6%, with chances of death about 23.52%. Ruptured liver abscess occurred in 1 case which is 1.6% of the study. Gangrene bowel occurred in 1 case which is 1.6%, and death occurred post operatively with chances of death about 100% in this study (Table no 2). Colonic perforation was not seen in this study.

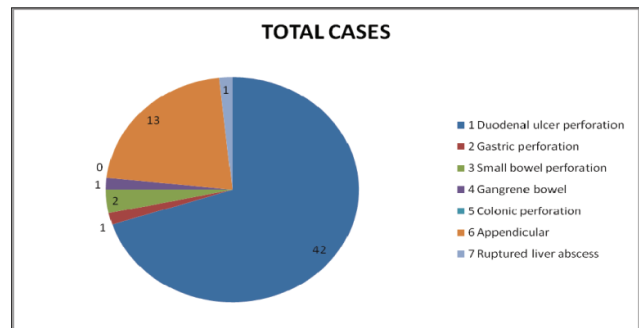


Figure 1 : Pie chart showing different causes for peritonitis in this study

Table 2: Relation of MPI score with mortality rate

Score	No. of cases	Deaths	%
<21	39	0	0
21-29	19	0	0
>29	2	1	50

DISCUSSION

Peritonitis is still one of most important surgical emergency. Despite of the progress in antimicrobial agents and intensive care treatment, the present mortality due to- diffuse peritonitis ranges between 10 to 20% and continues to be unacceptably high^{2,3}.

In an attempt to reduce the mortality in peritonitis by early identification of those who are at high risk, many scoring systems have been introduced so that early and objective classification of severity of peritonitis may help reduction of mortality^{4,5}.

Various other scoring systems have been used to assess the prognosis and outcome of peritonitis. Those used include the Acute Physiological and Chronic Health Evaluation score (APACHE II), the Peritonitis Index Altona (PTA), the Sepsis Score, and the Physiological and Operative Severity Score for Enumeration of Mortality and Morbidity (POSSUM). Among all of these the MPI scoring system and APACHE II found to be very useful.

APACHE II, which was introduced by Knaus and co workers^{6,7} integrates various physiologic variables during the first 24 hours in the intensive care unit (ICU) with age and chronic health status of the patient. This initial stratification of risk factors and a predictive equation estimates patient outcome. They are, however, complex, cumbersome and time consuming, maybe impossible to apply in the setting of intra abdominal sepsis^{8,9} and need a software to assess the mortality. And the APACHE II score has been found varyingly to underestimate or overestimate death, especially in high-risk patients and also found to have a lesser sensitivity and specificity than MPI score¹⁰. MPI has got an advantage of being simple, rapid, peritonitis specific and easily applicable

The present study is done with aim of assessing the prognosis of patients of peritonitis using Mannheim's peritonitis index.

The following observations were made from the study.

MPI SCORE:

Previous studies on MPI were done by Rodolfo L. et al¹⁰ and Rodriguez GH et al¹¹ in Mexico and Bruch HP et al¹², in which Rodolfo L. et al had mean score of survivors as 13 and mean score of non survivors as 29; Rodriguez GH et al had mean score of survivors as 21.5 and mean score of non survivors as 30.69; Bruch HP et al had mean score of survivors as 25 and mean score of non survivors as 31 whereas in the present study, the mean score of survivors is 21.27 and mean score of non survivors is 31.96

The age appears to be a significant prognostic index, with mean age of all patients was 37.25 yrs. Mean age of survivors 32.17 yrs and Mean age of non survivors is 53.16 yrs. In this study age is not found to be a statistically significant risk factor.

In our study mortality in male and female was Males – 00 % Female – 10 %

When subject for statistical analysis the P value was 0.16 which is not statistically significant showing no correlation.

Similar results found in the studies done by Rodolfo L et al¹⁰ and M.M. Correia et al¹³ (Brazil) in which Rodolfo L et al

had 5.55% mortality in males and 7.14% mortality in females, M.M. Correia et al had NA mortality in males and 25.5% mortality in females while in present study we had 0% mortality in males and 10% mortality in females

Because organ dysfunction and failure evolves in patients with sepsis, assessment of prognosis using this criteria is very useful. Our results were not comparable to studies done by Rodolfo L et al and M.M. Correia¹³ et al (Brazil). Rodolfo L et al had mortality with organ failure as 73.34% and mortality without organ failure as 0%, similarly M.M. Correia et al had 56.4% mortality with organ failure and mortality without organ failure is NA. In the present study mortality with organ failure is 1.6% and mortality without organ failure is 98.4%

When compared with study done by Rodolfo L et al and M.M. Correia et al our results did not correlate. Rodolfo L et al had mortality % with malignancy as 50% and mortality % without malignancy as 5.81%, while our study showed mortality % with malignancy as 0% and mortality % without malignancy as 98.4%.

If preoperative duration exceeds 24 hrs the chance of evolution of sepsis is high leading to multiorgan failure with irreversible changes which becomes unresponsive to the resuscitative therapy. It is not comparable to study done by Rodolfo L et al as the mortality % if >24 hrs was 12.7% and mortality % if <24 hrs was 0%, M.M. Correia et al states mortality % if >24 hrs was 74.5% and mortality % if <24 hrs was NA, while our study showed mortality % if >24 hrs as 2.2% and mortality % if <24 hrs as 0%

The results are comparable to study done by Rodolfo L et al and M.M. Correia et al. Their studies also did not demonstrate any correlation between focus of non colonic origin and mortality. Rodolfo L et al had mortality % with colonic origin as 5.55% while mortality % without colonic origin as 16.66%, while our study shows mortality % with colonic origin as 0% while mortality % without colonic origin as 0%

When there is a diffuse peritonitis the mortality is raised when compared to localized peritonitis. But the sample size in localized peritonitis group was very small. So it did not demonstrate a significant correlation (P value 0.95). Our study is not having similar results with the studies done by Rodolfo L et al and M.M. Correia et al.

The nature of peritoneal contamination fluid is an important determinant of the index. Our results showed Clear fluid in 3 cases, Purulent in 57 cases and Feculent in 0 cases. These results are different from the studies done by Rodolfo L et al and M.M. Correia et al. because of variations in sample size and organ of sepsis. The P value (measured by Chi

Square test) was not showing significant (P value 0.95) correlation. This is explained by the small sample size in the study.

CONCLUSION

The Mannheim Peritonitis Index is a specific, simple, reliable and accurate index in assessment of prognosis in patients of peritonitis. It shows significantly high mortality when the score is > 29. The predictive accuracy of the score can be increased by adding preoperative co morbid conditions like diabetes and hypertension to the criteria. It is a simple index for assessment when compared to APACHE II etc.

REFERENCES

1. Pacelli F, Battista DG, Alfieri S, Piccioni E, Sgadari A, Gui D, et al. Prognosis in intra-abdominal infections. *Arch Sur* 1996;131(6): 641-645.
2. Maddaus MA, Ahrenholz D, Simmons RL. *Biología de la peritonitis Surg Clin North Am* 1988;2:471-485.
3. Wittmann DH, Walker AP, Condon RE. Peritonitis e infección intraabdominal. In: Schwartz SI, Shires GT, Spencer FC, Husser WC, Editors. *Principios de cirugía*. 6th ed. Mexico: McGraw-Hill, Inc.; 1994. Pp. 1493-1528.
4. Giessing U, Peterson S, Freitag M, Ludwig K. Surgical management of severe peritonitis. *Zentralbl Chir* 2002 ; 127:594-7.
5. Farthmann EH, Schoffel U. Principles and limitations of operative management of intraabdominal infection. *World J of Surg* 1990; 14:210-7.
6. Knaus WA, Zimmerman JE, Wagner DP, Draper EA. APACHE — acute physiology and chronic health evaluation: a physiologically based classification system. *Crit care med* 1981; 9:591-7.
7. Knaus WA, Zimmerman JE, Draper EA. APACHE II : a severity of disease classification system. *Crit care med* 1985;13:818-29.
8. Rogy M, Fugger R, Schemper M, Koss G, Schulz F. The value of 2 distinct prognosis scores in patients with peritonitis. The Mannheim peritonitis index versus the Apache II score. *Chirurg* 1990 Apr; 61(4):297-300.
9. Demmel N, Muth G, Maag K, Ostelholzer G. Prognostic score in peritonitis. the Mannheim peritonitis index or APACHE II? *Arch Chir* 1994;379:347-52.
10. Rodolfo L. Bracho-Riquelme MC, M en C, Armando Melero-Vela MC, Aidee Torres-Ramirez MC. Mannheim Peritonitis Index Validation Study at the Hospital General de Durango. *Cir Ciruj* 2002; 70: 217-225.
11. Rodríguez-Gojón GH, Pérez-García R, Poblano-Morales M, Rodríguez-Brambilia V, Chavero-García V. Factores pronósticos asociados a mortalidad en pacientes con sepsis abdominal tratados en la unidad de terapia intensiva. *Cir Cir* 1999;67(6):205-207.
12. Bruch HP, Woltmann A, Eckmann C. Chirurgisches management bei peritonitis und sepsis. *Zentralbl Chir* 1999;124(3):176-180.
13. Correia, M.M.; Thuler, L.C.S; Velasco, E.; Vidal, E.M. e Schanaider, A. Prediction of death using Mannheim Peritonitis index oncologic patients. *Revista Brasileira de Cancerologia*, 2001, 47(1): 63-68.

Please cite this article as: Suresh Clement, Vinay Kumar Y, Ramchander S, Vamshi Bharath P. A Study on Clinical Assessment of Peritonitis using Mannheim's Peritonitis index. *Perspectives in medical research* 2017;5(1):21-24.

Sources of Support: Nil, Conflict of interest: None declared.