

A Prospective Study of Evaluation of Mannheim Peritonitis Index to Predict outcome of Patients with Peritonitis

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ABSTRACT

Introduction Despite advances in diagnosis, management and critical care of patients with peritonitis due to hollow viscus perforation and others, prognosis remains poor. Early assessment by scoring systems will influence the management and prognosis. AIM- To assess the predictive value of Mannheim peritonitis index among patients with intraoperative diagnosis of peritonitis at the surgical department and, to evaluate the severity of peritonitis and to make a prognosis of survival, mortality by considering the risk factor analysed in the index.

Material and Methods: A prospective, descriptive, transversal and observational study was undertaken. Both sex were included in the study with age more than 14 yrs and older with diagnosis of peritonitis confirmed during surgery regardless of cause. Once the diagnosis of peritonitis has been confirmed by operative findings, the patient was accepted in the study.

Results: Of the sample of 150 patients, 28 were female(18.7%) and 122 were male(81.3%). Group mean age was 41.8 years with a median of 40 years and a range from 14 years and above. Mean age of survivors were 39.78years, among non survivors, mean age was 53 years .Group mean MPI Score was 18 points. Among surviving patients, mean score was 16 points and among non-survivors, mean was 27 points.

Conclusion: Mannheim peritonitis index is disease specific and an easy scoring system to predicting the mortality in patients with peritonitis due to secondary causes, increasing Mannheim peritonitis index score is directly proportional to mortality of the patient.

Keywords: Mannheim scoring system, peritonitis, surgery, abdomen

are aerobic and anaerobic streptococci, Clostridium welchii, bacteroides, staphylococci, Klebsiella, Salmonella typhi.^{5,6}

Tertiary peritonitis is defined as persistent or recurrent intraabdominal infection after sufficient treatment for primary or secondary peritonitis. It usually occurs after 48 hours. It occurs after abdominal surgeries, which is usually severe and the patient may go in for Systemic Inflammatory response syndrome or Multi organ dysfunction syndrome. It is common in immunosuppressed patients with ineffective peritoneal host defenses. Infection due to E. faecalis, E. faecium, S. epidermidis, P. aeruginosa, C. albicans are common in such patients. Virulence and resistance to the drugs are other factors.^{7,8}

Peritonitis from hollow viscus perforation is a potentially life threatening situation. The prognosis is poor despite the recent advances in diagnosis and management. Early diagnosis of patients with severe peritonitis is very important as it may help in selecting appropriate patients for aggressive surgical approach.⁹⁻¹² Empirically risk assessment for some important clinical events had been very useful in evaluating newer treatment modalities, in observing resources for effective utilisation and improving standard of care.¹³⁻¹⁷ Many scoring systems had been developed successfully to grade the severity and prognosis of patients of acute peritonitis like, Acute physiology and chronic health evaluation (APACHE) II score, Simplified acute physiology score (SAPS), Sepsis severity score (SSS), Ranson score, Imrite score, Mannheim peritonitis index (MPI).

Mannheim peritonitis index (MPI) was developed by Wacha and Linder in 1983.¹⁸⁻²¹ It was designed based on the retrospective analysis of the data from patients with peritonitis, in which 20 possible and significant risk factors were considered. Among these 20 risk factors, only 8 proved to be of prognostic relevance and they were entered into the Mannheim Peritonitis Index and they were classified according to their predictive power. Patients with a score more than 26 are defined as having a high mortality rate. The Mannheim Peritonitis Index (MPI) is a specific score, which has a very good accuracy and serves as an easy way to assess clinical parameters, allowing the determination of the individual prognosis of patients with peritonitis. Till now are no reliable published Indian studies so far to assess the validity of

INTRODUCTION

Peritonitis is inflammation of peritonium of the abdomen and it covers most of the abdominal organs. It may be localized or generalized, and may result from infectious (often due to rupture of a hollow abdominal organ) or from a non-infectious process. Primary peritonitis has no documented source of infection. Infection usually spreads from lower genitals through fallopian tubes, from upper respiratory tract infection or from middle ear in males. It is uncommon after 10 years of age. It is common in malnourished child and child with nephritis. It is commonly due to pneumococci, and can occasionally be due to streptococci, haemophilus, gonococcus and other gram-negative (Escherichia coli) organisms. Child is toxic, severely ill and develops septicaemia very early. It is also seen in ascites, patient with indwelling catheter for peritoneal dialysis, patients with peritoneovenous shunt. It can also be due to Chlamydial, fungal or mycobacterial infection.¹⁻⁴

Secondary peritonitis is secondary to any intra abdominal bowel or other visceral pathology, e.g. perforation, appendicitis. E. coli (70%) is the most common organism involved. Other bacteria

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this scoring system.

Study aimed to confirm the predictive value of Mannheim peritonitis index of patients with diagnosis of peritonitis at the surgical department Chengalpet medical college, to evaluate the severity of peritonitis and to develop a system to assess the prognosis survival, mortality, considering the important risk factor analysed in the index.

MATERIAL AND METHODS

A prospective, descriptive, transversal and observational study was undertaken. Both sex were included in the study with age more than 14 years and older with diagnosis of peritonitis confirmed during surgery regardless of etiology. Once the diagnosis of peritonitis has been determined by operative findings, the patient was accepted in the study. This study is conducted in Chengalpet Medical College during 2015 to 2016. Ethical committee clearance was obtained informed written consent obtained from all the patients.

Using a data collection sheet, the risk factors found in Mannheim peritonitis index (MPI). were classified according to values indicated in table-1 and individual risk factor scores were added to establish the initial Mannheim peritonitis index (MPI) score. All details were collected from patients with consent. Patient were followed as per standard guidelines, indicating presence of complications or improvement or death.

Group mean MPI Score was 18 points. Among surviving patients, mean score was 16 points and among non-survivors, mean was 27 points.

DISCUSSION

The peritonitis is caused by inflammation of peritoneum mainly due to ruptured hollow viscus. The classic clinical signs of peritonitis are fever, pain, nausea, vomiting, rebound tenderness, guarding and rigidity and paralytic ileus .^{2,3} The diagnosis may be delayed by the recent postoperative status, immunocompromised situation, concomitant use of antibiotics and to some extent the age. The effect of bacteria and certain digestive enzymes on the serosal surface leads to an exanguination

of serum proteins and electrolytes from the vascular compartment to the abdominal cavity and in turn enzymatic digestion and necrosis of the same. The traditional pathophysiologic finding in perforative peritonitis is an exudate high in granulocytes, that may be diffuse or localized and confined to an abscess. Systemically, there is peritoneal ileus, hemoconcentration and alterations in cardiac output most probably due to the shift of fluids and then metabolic acidosis. Intrapulmonary shunting like arterio venous shunt, gross hypoxia, hypo or hypercapnia, acute tubular necrosis, gradual azotemi and renal failure, weight loss due to protein consumption due to proteolysis, loss of heat production due to hypothermia and exhaustion are some other complications that in turn leads to the death of the patient.⁴⁻⁷ Peritonitis in patients has high mortality rates, and it is related to the severity and duration of the underlying disease. The patients do not survive severe infections. significant disturbances of the immune system mechanism has been demonstrated in old and patients with comorbidities, such as loss of the anatomic barriers and abtrations in the phagocytic activities and humoral and cellular immune responses.⁸⁻¹² The consumption of opsonins may occur due to severe infections leading to failure of the immune system. Among the known prognostic score indices used for classifying patients with peritonitis are the Acute Physiology and Chronic Health Evaluation (APACHE) and the Peritonitis Index Altona (PIA).² The APACHE II system is mainly based upon physiological findings and it is adjusted according to the patient's progress. It has a certain range of scores with small increments, each factor contributes to the risk assessment, and the score value determines the mortality risk of the patient, and compares with the observed mortality. The Peritonitis Index Altona (PIA) is based upon history and the clinical examination derived data, intraoperative findings, and physiologic information.^{20,21} Here Qualitative variables are transformed into quantitative data and it has proved to be having predictive value for death. The Mannheim peritonitis index (MPI) is very specific score, it has a good accuracy and it provides an very easy way to handle the clinical datas, allowing the assessment of individual prognosis of patients with peritonitis. Our statistical validation showed the Mannheim peritonitis index (MPI) to be an accurate and a very reliable predictor of mortality in surgical patients, and we believe that the inclusion of a pathophysiologic variable may raise its accuracy.

CONCLUSION

Mannheim peritonitis index (MPI) is specific to particular disease and it is easy for predicting the mortality in patients with peritonitis secondary to intra abdominal pathology. Increased scores are associated with poorer prognosis, needs intensive care and hence it can routinely be used in clinical practice.

Risk factor	Points
Age> 50 years	5
Female sex	5
Organ failure	7
Malignancy	4
Preoperative duration of peritonitis >24 hours	4
Origin of sepsis not colonic	4
Generalized peritonitis	6
Exudate clear	0
Exudate cloudy and purulent	6
Exudates fecal	12

Table-1: Mannheim peritonitis index scoring

Anatomical location	No. of death	Discharged	Wound sepsis	Total
Duodenal perforation	7(8%)	67(81%)	9(11%)	83
Appendicular pathology	1(7%)	12(80%)	2(13%)	15
Gastric perforation	6(38%)	7(44%)	3(18%)	16
Small bowel	5(26%)	13(68%)	1(6%)	19
Large bowel	2(29%)	5(71%)	0	7
Miscellaneous	2(20%)	6(60%)	2(20%)	10

Table-2: Statistics

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