STUDY OF PROGNOSTIC FACTORS IN PERFORATIVE PERITONITIS
Chandrashekar N1, Prabhakar G. N2, Gurukiran C. S3, Shivakumarappa G. M4, Naveen H. M5


ABSTRACT: This is a prospective hospital based study conducted in our hospital from June 2008 to July 2010 involving a total of 50 patients with perforative peritonitis. Prognostic factors and the validity of scoring systems were analyzed.

Age over 50, longer duration of perforation, presence of shock on day one, extent of peritoneal contamination and associated medical illness adversely affect prognosis. Enteric and duodenal perforations carry a higher mortality. Both MPI and Sepsis Score accurately predicted mortality and morbidity rates.

KEYWORDS: peritonitis, perforation, sepsis, scoring.

INTRODUCTION: Perforative peritonitis is one of the major problems confronting surgeons. Despite many advances in management, the mortality rate of diffuse suppurative peritonitis remains unacceptably high1. Various studies show a 12-40% mortality2.

The complex nature of surgical infections, the multifaceted aspects of treatment, and the increasing complexity of ICU support make evaluation of new diagnostic and therapeutic advances in this field very difficult. Scoring systems that provide objective description of the patient’s condition at specific points in the disease process aid our understanding of these problems.

The aim of this study was to study the prognostic factors which determine the outcome of the disease and to evaluate the use of the scoring systems, Mannheim Peritonitis Index (MPI) and Sepsis Score of Elebute and Stoner, presently being studied worldwide.

MATERIAL AND METHODS: This proposed study was conducted at Sree Siddhartha Medical College, Hospital and Research Centre, Tumkur, Karnataka, over a period of 2 years from June 2008 to July 2010.

The study included all patients with perforative peritonitis admitted to the surgical wards of this institution in the above said period. Excluded from the study were patients with peritonitis due to gynecological causes, biliary peritonitis, post operative peritonitis, traumatic peritonitis and patients below 12 years.

A detailed history was taken and a thorough physical examination done for each patient.

Investigations for each patient included : (a) Blood investigations – Hb %, TC, RBS/FBS, blood urea, serum creatinine, serum electrolytes, liver function tests, WIDAL test, Serum Amylase; (b) Urine examination; (c) Radiological examination to detect pneumoperitonium; (d) Ultrasound abdomen; (e) ECG; (f) Diagnostic peritoneal tapping; (g) Biopsy from the edge of the perforation wherever possible.

The preoperative preparation of each case essentially consisted of correction of dehydration, overcoming the shock if present, gastric aspiration, urinary catheterization, parenteral broad spectrum antibiotic coverage and tetanus prophylaxis.
The treatment adopted in each case was decided by the attending surgeon. Operative procedure varied according to the location of perforation.

Post operative complications were studied in the immediate follow up period. Mannheim Peritonitis Index (MPI) and Sepsis Score of Elebute and Stoner were employed for all patients.

Results were analyzed and compared with previous studies.

RESULTS: Mortality rate was more in extremes of age that is <20 years and > 50 years group. Patients aged < 50 yrs did better than older patients with 29% & 58% being their mortality rate respectively.

Majority of patients were males – 45; mortality rate was more in females (40%), but this difference was not statistically significant.

Duodenal perforation was the commonest (72%) cause of perforative peritonitis followed by ileal perforation. The mortality rate of duodenal perforation was 36%, while that of ileal perforation was 45%; perforation of appendix and stomach had 0 % mortality.

Mortality increased correspondingly with delay in presentation. Delay in presentation of > 24 hours increased the mortality from 6% to 30%. Delay of >72 hours was associated with a mortality of 79%.

As many as 26 patients (52%) presented with shock on day one. They had high mortality of 15 (58%) in comparison to 3 (12%) in patients without shock.

Mortality increased exponentially with MPI score more than 26 (86% mortality). Mortality rate in sepsis score <20 was 7% while it jumped to 76% with a sepsis score > 20.

DISCUSSION: Perforation is a dreaded complication and if not treated in time, can terminate fatally. In the present study on 50 patients in District Hospital Tumkur and Sree Siddhartha Medical College & Hospital, it was found that various factors like old age, associated medical illness, shock at the time of admission, and extent of peritoneal contamination are important adverse prognostic factors.

AGE: Age seem to be an important factor in determining the outcome. Age > 50 years was a significant adverse prognostic factor. This is in agreement with studies by Wacha et al.\(^3\), and was hence incorporated into Mannheim Peritonitis Index where age >50 year was given weight age of 5 points of severity.
Factors like decreased functional reserve, concomitant other illness such as diabetes and hypertension seem to be the cause of increased mortality in elderly patients.

**GENDER:** Although the mortality rate was apparently higher in females, this difference was not statistically significant.

**DURATION OF PERFORATION:** In this study, duration of perforations at the time of presentation seemed to have a major impact on mortality. This is in complete agreement with the result of most studies (Tripathi et al.; Dandepat et al.). The value of 4 points given in MPI is in agreement with this. The spread of peritonitis, shock due to delay and onset of sepsis syndrome seem to be the main causes for increase in mortality rate. This has to be weighed against patient factors like age and associated medical problem also. Even after discounting these factors there seem to be definite increase in mortality due to delay in presentation (Svoannes).
SITE OF PERFORATION: As with most studies, duodenal perforation formed bulk of the cases 36/50. They contributed as much as 72% to the mortality due to the number of cases itself. They had a mortality rate of 36%. Enteric perforation had higher mortality of 45%. Delay in presentation, typical clinical features and general complications of typhoid seem to contribute to higher mortality rate (Nair et al⁶, Bobin et al⁷).

Table: Site of Perforation and Mortality rate

<table>
<thead>
<tr>
<th>Aetiology</th>
<th>Present study</th>
<th>Nair⁶</th>
<th>Tripathi</th>
<th>Delinger</th>
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<tbody>
<tr>
<td>Peptic perforation</td>
<td>36%</td>
<td>-</td>
<td>16.6%</td>
<td>41%</td>
</tr>
<tr>
<td>Enteric</td>
<td>45%</td>
<td>48%</td>
<td>32%</td>
<td>-</td>
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SHOCK: In the present study, effect of shock on day 1 was associated with significant mortality (58%) similar to other studies (Dandapat⁴; Dellinger et al²). MPI also gave seven risk points to multiorgan failure, a culmination of shock and other systemic manifestations.

Table: Effect of Shock on Mortality

<table>
<thead>
<tr>
<th></th>
<th>Present study</th>
<th>Dandapat</th>
<th>Dellinger et al</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock on day 1</td>
<td>58%</td>
<td>62.5%</td>
<td>51%</td>
</tr>
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</table>

MPI SCORE: MPI score was specifically designed to evaluate prognostic factors in peritonitis. It is easy and reliable. The results of the present study correspond to the study by Billing et al⁸. This validates the use of MPI score in peritonitis.
MPI AND MORTALITY RATE

SEPSIS SCORE OF ELEBUTE AND STONER: In sepsis score, similar to MPI, the mortality rate increased with increase in score. Mortality rate was 7% for <20, 76% for >20. The findings are similar to previous studies (Elebute\cite{6}; Dominioni\cite{10}). The advantage of sepsis score is that it can be used both as a single indicator and for follow up.
CONCLUSION: Age >50 years seems to have an adverse effect on the outcome in perforative peritonitis.

The impact of sex on outcome could not be conclusively proved, even though females seem to have poorer prognosis.

The type and extent of peritoneal contamination seem to have a bearing on mortality. Patients with diffuse peritonitis and with faecal contamination do worse.

Delayed presentation has an important adverse effect on both mortality & morbidity. However this is beyond the control of the surgeon. Only adequate health education and a proper referral mechanism can help in this regard.

There is wide scope for the use of MPI and Sepsis Score of Elebute & Stoner. These scoring systems help to determine the risk of patient preoperatively as well as assist the surgeon in his decision regarding surgery. Definitive surgery can be done safely in low score patients; aggressive, newer modalities of treatment need to be tried in high score patients.

Cases of peritonitis carry a high mortality which can be reduced by early diagnosis, risk stratification, and appropriate treatment based on risk score.
BIBLIOGRAPHY:


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