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EFFECTIVENESS OF MANHEIM PERITONITIS INDEX IN PREDICTING MORBIDITY AND MORTALITY OF PATIENTS WITH HOLLOW VISCUS PERFORATION IN TERTIARY CARE CENTER

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ABSTRACT

The peritoneal cavity is the largest cavity in the body, the surface area of its lining membrane (2 m^2 in an adult) being nearly equal to that of the skin.Peritonitis is inflammation of the peritoneum peritoneal cavity caused by localized or generalized infection. Primary peritonitis results from bacterial , fungal or mycobacterium infection without HVP . Secondary peritonitis occur in setting of GI or GU perforation or due to inflammations of appendix , colonic diverticulum and pelvic inflammatory diseases

Acute generalized peritonitis from gastrointestinal hollow viscus perforation is a potentially life threatening condition[3]. Despite aggressive surgical treatment and evolution of critical care, the prognosis of peritonitis is not good especially if multiorgan failure develops. Early identification of patients with severe peritonitis may help in selecting patients for aggressive surgical approach and thereby preventing further complications[4]

There are many scoring system(table 1)out of which APACHE II and MPI are superior to others.MPI was developed by Wacha and Linder in 1983 in a German retrospective study and then validated. Of the possible twenty risk factors only eight proved to be of prognostic relevance and were entered into a score. (Table2). MPI scoring system contains clinical factors that are simpler and the information is collected at the time of admission and first laparotomy[5.] Based on the MPI score,

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Table 1:Various Scoring system in practice to grade the severity ofacute peritonitis

patients were categorized into three groups: i) Score ≤ 20 ii) Score 21-29 iii) score ≥ 29 , Maximal possible score is 47 and minimal possible score is zero.

We need a prognostic scale to classify the severity of peritonitis ,which is easy and simple to follow to predict the outcome and select the patient for aggressive surgical treatment and ICU care. The purpose of this study is to evaluate the efficacy of Mannheim Peritonitis Index (MPI) score for predicting the outcome in patients with peritonitis in terms of morbidity and mortality.

Scoring system in practice to grade the severity of acute peritonitis

1.Acute Physiology And Chronic Health Evaluation(APACHE)2 Score

2.Simplified Acute Physiology Score(SAPS)

3.Physiological And Operative Severity Scoring For Enumeration Of Mortality And Morbidity(POSSUM)

4.Mannheim Peritonitis Index(MPI)

5.Peritonies Index Altona(PIA)

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METHODOLOGY

This is a prospective cross sectionalstudy of 53 patients conducted in The Oxford Medical college Hospital, Bangalore, Karnataka, India, from january 2021 –july 2022.

Inclusion criteria

Patients presenting with peritonitis secondary to hollow viscus perforation

Exclusion criteria

Patients with primary peritonitis,

Age less than 15 years

Patient not willing for treatment.

After clinical diagnosis of HVP and confirmation by radiological image study,initial preoperative work up and resuscitation with intravenous fluids, antibiotics, analgesics, nasogastric decompression and per urethral catherisation was done in all the cases.Based on cause and site of perforation appropriate surgical procedure was performed. Peritoneal lavage was given in all cases. Further post op and ICU care was given.

Patients were followed up postoperatively till the outcome i.e. mortality, morbidity or discharge. The MPI [Table-2] was applied along with other clinical and biochemical parameters recorded in pre-structured proforma. Prediction was categorized into 3 groups: i) score ≤ 20 ii) Score 21-29 iii) score ≥ 30.

Following which statistical analysiswas done using EPIINFO and SPSS (Version 16). Chi-squared test was used for intergroup comparisons. Risk ratio and 95% confidence interval (CI) were calculated for each group. ROC analysis was performed to identify the threshold with highest sensitivity and specificity and that threshold was used for classification in uni-variate and binary logistic regression analysis. The level of significance was fixed at p-value of < 0.05 for predictingstastistical significance.

Results

In our prospective study mean age group of affected patients was 35.19 (± 12.77) years, with male predominance (38 males and 15 females).

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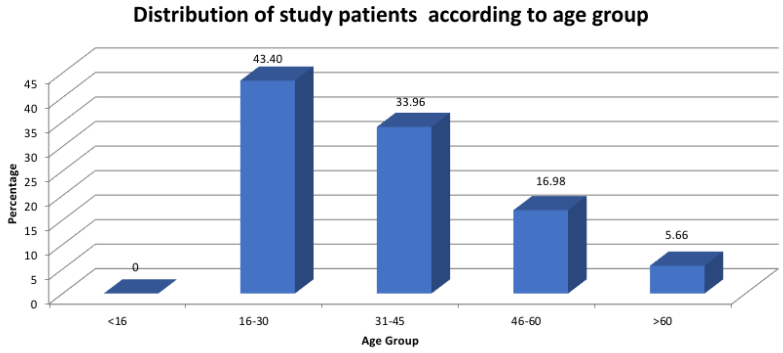
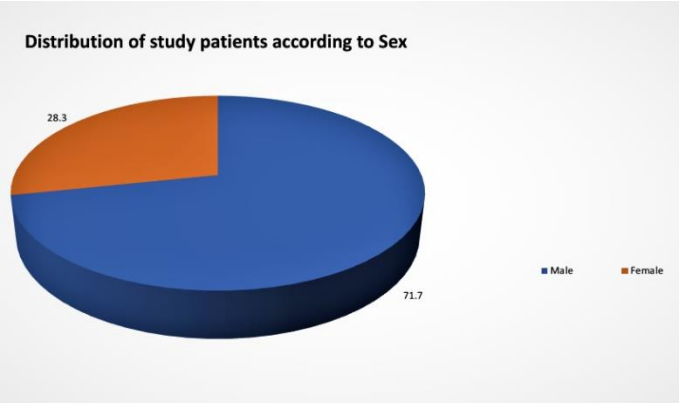
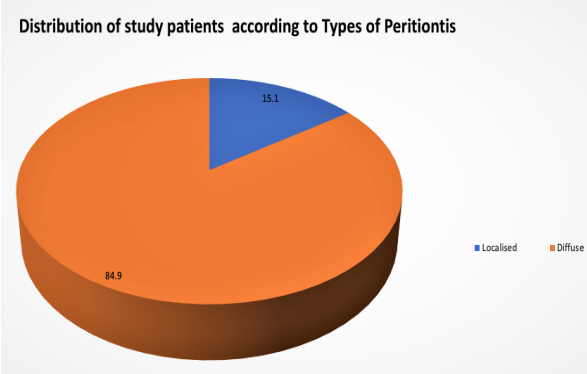




The most common cause of perforation in our study was peptic ulcer perforation (32.0%) followed by appendicular perforation(30.10%) with the least being nonmalignant intestinal obstruction(3.7%) .



The most common site of perforation was appendix(30.1%),followed by ileum(24.52%) and least perforation was noted in colon(3.77%).

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Simple closure of perforation was done in 5% cases, closure with omental graft was done in 32.07% cases, resection anastomosis with stoma done in 17.53%, resection anastomosis without stoma in 11.32% and appendicectomy in 30% case.

There were 5 deaths (9.43%) in our study, 3 patients died of multiple organ dysfunction and 2 patients died of septicaemia and ARF.

For those who survived, Mean days of hospitalization was 15.5 days.24 patients (47.16%) were discharged within 2 weeks with no complications.

SUMMARY OF MPI	SURVIVED	DEATH	TOTAL	PVALUE
Age >50 yrs	7(70%)	3(30%)	10	0.69
Female gender	13(86.66%)	2(13.33%)	15	0.46
Organ failure	7(58.33%)	5(41.66%)	12	0.04
Malignancy	4(50%)	4(50%)	8	0.14
Preoperative duration >24hrs	23(82.14%)	5(17.85%)	28	0.17
Origin of sepsis non colonic	47(92.15%)	4(7.84%)	51	0.31
Diffuse peritonitis	40(88.88%)	5(11.11%)	45	0.46
Clear exudate	6(100%)	0	6	0.17
Cloudy /purulent exudate	41(95.34%)	2(4.65%)	43	0.68
Fecal exudate	1(25%)	3(75%)	4	0.03

Overall morbidity in our study was 43.39%. surgical site infection (SSI) was seen in 9.43% cases ,burst abdomen in 7.54% cases, Hypotension in 5.66% cases, Pulmonary complications were seen in 11.32% cases, anastamotic leak in 1.88% and ARF was observed in 7.54% cases respectively. According to the analysis MPI score of ≥ 21 had 5.72 times higher risk of morbidity than MPI score of ≤ 21 (CI 1.60 – 20.48, p=0.005).

DISCUSSION

In our study, we found that among the patients presenting with peritonitis due to HVP, most were males with mean age of 35.19 .

In our study patients with MPI scores of ≤ 20, 21-29, ≥ 30 had a mortality of 0%, 27.28%, and 100% respectively. When the mortality rate was calculated by MPI

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score for each group, it was seen that with increasing MPI score the mortality rate also increases.

The overall morbidity rate was 43%.pulmonary complications (11.32%), Surgical site infection (9.43%), were common complications among patients. In our study greatest sensitivity and specificity for the MPI score as a predictor of mortality was at the score of 25.

Patients with MPI score > 25 had 6.45 times higher risk of mortality than patients with MPI score of ≤ 25 (CI 1.1-37.9, p=0.03),which is statistically significant.

In a study conducted by Qureshi AM et al., score of < 21 had mortality of 1.9%, score of 21-29 had 21.9% and score > 30 had mortality of 28.1%. Mortality rate for MPI score more than 26 was 28.1% while for scores less than 26 it was 4.3%. [6]

Kusumoto yoshiko et al., evaluated the reliability of the MPI in predicting the outcome of patients with peritonitis in 108 patients. A comparison of MPI and mortality showed patients with a MPI score of 26 or less to have mortality of 3.8%, where as those with a score exceeding 26 had mortality of 41.0%.[7]

Billing et al. in a meta analysis of 2003 patients reported a mean sensitivity of 86% (54%-98%) an specificity of 74% (58%-97%) at a score of 26 points.[8]

The results of our study are similar to observations that have been made by international publishers who have carried out studies for evaluation of Mannheim peritonitis index.

CONCLUSION

The MPI used to measure the prognosis and outcome in patients with peritonitis secondary to HVP is found to be an accurate and reliable predictor of surgical mortality and morbidity in tertiary hospitals. Identifying these high-risk patients with MPI scores 21-29 early and providing proper resuscitation with early appropriate surgical care can significantly reduce the rate of mortality and morbidity.

Therefore, to summarize we can say that MPI score is an excellent prognostic index for peritonitis with high accuracy in individual prognosis and that it is cheap, cost-effective, easily measurable, and reproducible.

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