# Comparison of Platelets, Lymphocytes, Eosinophils as a Prognostic Marker in Perforation Peritonitis and Correlation with JPSS

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## ABSTRACT

Perforation peritonitis is one of the most common surgical emergencies in India and is a common form of acute intrabdominal infection that results from the perforation of a viscous. Several factors associated with mortality were taken into consideration such as age, presence of co-morbidities, Perforation to operation interval, preoperative shock, heart rate, serum creatinine. Each factor was given score based on its severity to construct the simplified prognosis or Jabalpur prognostic scoring system (JPSS). This is a prospective, observational, comparative, single center study to be carried out in N.S.C.B. Medical college and hospital Jabalpur Department of General Surgery in time period of two years. Aims are- comparison of platelets, lymphocytes, eosinophils as a prognostic marker in perforation peritonitis and correlation with JPSS. Secondary aim of study is to aid the physician in better prognosis and treatment for perforation peritonitis. All patients diagnosed with perforation peritonitis is to be included in the study. Minimum 60 patients are to be enrolled in the study from November 2019 to August 2021. Age, gender and length of stay in the hospital will be recorded. Furthermore, the measurements of the blood haemoglobin level, leukocyte, neutrophil, lymphocyte and eosinophils which will be obtained from the patients' medical case record. In the evaluation of the sensitivity and specificity of the parameters in diagnosis and to predict prognosis, the ROC curve test to be used ($p<0.05$). The analysis of 84 cases of hollow viscous perforation, who underwent emergency laparotomy. In the study, out of 84 cases 83.4% were male and 16.6% were female, most common age group affected was 46-55 (25%). mean age 43.3 +/-SD 15.047. Most common site of perforation found to be pre-pyloric in 61.9% male and 10.77% female next most common site observed was ileum in 16.7%male and 1.19% female. Other sites comprise were Gall bladder (1.2%), Duodenum (1.2%), Jejunum (1.2%), Appendix (1.2%), caecum (1.2%), ascending colon (1.2%), transverse colon (2.4%). The JPS calculated on pre-operative day, post operative day 1,2,3,5, and 7, respectively. The JPS was <5 in 48.8, 58.3, 61.9, 65.5, 66.7 and 71.4% patients on preoperative day, post operative day 1,2,3,5 and 7 respectively. JPS was 6-10 in 46.4, 36.9, 32.1, 29.8, 27.4 and 21.4% patients on preoperative day, post operative day 1, 2, 3, 5 and 7, respectively. The JPS was 11-15 in 3.6, 3.6 and 2.4%, patients on pre-operative day, post operative day 1, 2 and 3, respectively. In this study platelets count have shown rising trend as post operative days passes without any statistically significant variation. Same trend has also seen in lymphocyte count after second post operative day with persistent rise in mean value of it, without any statistically significant variation. Absolute eosinophil count has shown very minimal, irregular, statistically not significant change as post op days passed. Among platelets, lymphocytes and eosinophil, platelet count and lymphocytes can be used as a reliable marker in early detection of sepsis.

## INTRODUCTION

Perforation peritonitis is the commonest surgical emergency in India. Inspite of advances in diagnosis, intensive care treatment, surgical techniques and antimicrobial therapy management of perforation peritonitis continues to be challenging for the surgeons.

Peritonitis is often secondary to an infection into the otherwise sterile peritoneal environment through perforation of gastrointestinal tract or a chemically irritating material, such as gastric acid from a perforated ulcer[1]. Frequent causes of secondary bacterial peritonitis include perforation due to peptic ulcer disease, acute appendicitis, ileal perforation due to typhoid & tuberculosis, jejunal perforation most often due to blunt trauma, colonic perforations secondary to closed loop obstruction or malignancy. Many recent reports have shown that eosinopenia as a marker for sepsis due to result of migration of eosinophils into inflammatory sites due to release of chemotactic factors. In addition to this in developing countries, most of the patients present to the clinic late with septicemia, increasing the morbidity and mortality of the disease. This increases the need for a tool predicting the morbidity and mortality in patients with perforation peritonitis.

Mishra *et al.*[2] conducted a study with the view of developing a simplified prognostic scoring system for peptic ulcer perforation in developing countries. 140 patients with perforation peptic ulcer undergoing gram patch omentopexy closure were studied. Several factors associated with mortality were taken into consideration such as age, presence of co-morbidities, Perforation to operation interval, preoperative shock, heart rate, serum creatinine.

**Jabalpur prognostic score[2]:** It is a simplified scoring system for peptic ulcer perforation[5]. Each factor is given a score based on its severity in accordance with APACHE-II scoring system to construct a simplified prognostic scoring system. It is simple and user friendly as it uses only 5 routinely documented clinical risk factors:

- Perforation-operation interval
- Mean systemic BP
- Serum creatinine
- Heart rate
- Age

**Aims and objectives:** This is a prospective/ observational/comparative study to be carried out in N.S.C.B. Medical college and hospital Jabalpur Department of General Surgery in time period of two years. Aims are: Primary aim is comparison of platelets, lymphocytes, eosinophils as a prognostic marker in perforation peritonitis and correlation with Jabalpur prognostic scoring system. Secondary aim of study is to aid the physician in better prognosis and treatment for perforation peritonitis.

**Patient group:**

- Approved for prospective study who are going to be operated for perforation peritonitis.
- Perforation peritonitis cases is to be identified from patients admitted in the N.S.C.B. medical college and hospital Jabalpur. All patients diagnosed with perforation peritonitis is to be included in the study. Minimum 60 patients are to be enrolled in the study.

All patient admitted in NSCB medical college and hospital having diagnosed cases of perforation peritonitis from November 2019 to August 2021.

## MATERIALS AND METHODS

**Material used in procedure:** Age, gender and length of stay in the hospital will be recorded.

Furthermore, the measurements of the blood haemoglobin level, leukocyte, neutrophil, lymphocyte and eosinophils which will be obtained from the patients' medical case record.

**Method:**

- Measurement of blood investigation to be done on
- Pre-op
- 1ST post-op day
- 2nd post-op day
- 3rd post-op day
- 5th post op day
- 7th post-op day

**Biochemical analysis:** The routine biochemical parameters is to be examined in the venous blood samples taken when the patients gets admission to the hospital. In the biochemistry laboratory, haemoglobin, platelet count, leukocytes, neutrophil, eosinophils and lymphocytes counts to be determined using an analyser device (Mindray BC-3600, Shenzen, China).

Demographic and laboratory data is to be reported as mean, median, standard deviation, minimum, maximum and percentage values. The differences between groups of non-parametric data is to be evaluated using the mann-Whitney U test ($p<0.05$). Parametric data is to analyzed using the independent samples t-test ($p<0.05$). Spearman r correlation and pearson correlation analyses were applied to determine correlation between the parameters of the patients($p<0.05$).

In the evaluation of the sensitivity and specificity of the parameters in diagnosis and to predict prognosis, the ROC curve test to be used(p<0.05).

**Eosinopenia as a marker of sepsis:** The clinicians need sufficient tests to promptly diagnose sepsis as early diagnosis and treatment will significantly reduce the mortality and morbidity[6]. An early diagnosis of septicemia without microbial culture would ensure early administration of antibiotic therapy this in turn reduce the patient mortality.

It is well known fact that in acute infection/inflammation there is rapid decrease in the number of circulating eosinophils[6]. This marked reduction in the number of circulating eosinophil leucocytes in acute infection was first described by Julius[6] and widely used in the last century as a useful diagnostic sign. This was followed later by the information that eosinopenia is part of the normal response to stress[7], it was said that eosinopenia in acute infection is a secondary response to stress induced by the infection." The value of this old marker of acute infection was tested by Gil and colleagues[8].

Gold standard test for the identification of sepsis has not been identified so far; but Procalcitonin is found to play promising role in septicemia and it is found to complement clinical findings and lab test results in cases of septicemia[9].

Absolute eosinophil count being cheaper performs equally well as procalcitonin in the diagnosis of sepsis. Study by Manivannan decrease in absolute eosinophil count as a reliable marker of mortality in perforative peritonitis. Eosinopenia was used to identify septicemia in this study.

Eosinopenia can be considered a better marker of sepsis than CRP and an useful tool in intensive care setup[10].

Trombocytopenia is commonly found in association with serious infection[11-16]. Previous studies have reported an incidence of thrombocytopenia (platelets counts<100,000 mm$^{-3}$) as high as 77% in medical patients with gram-negative infection. Similarly, surgical patients with septicemia frequently develop a reduction in platelet count. In both groups, the thrombocytopenia of sepsis appears reversible in patients who survive.

**Jabalpur prognostic scoring system (JPSS)[17]:** The Jabalpur scoring is effective for prognostication in case of peptic perforation. It is simple and user friendly as it uses only six routinely documented clinical risk factors like Perforation and Operation interval, mean systolic BP, Heart rate, serum Creatinine and Age. The total score is calculated by adding all the individual scores. Mishra et al.[2] conducted a study with the view of developing a simplified prognostic scoring system for peptic ulcer perforation in developing countries. About 140 patients with peptic ulcer perforation undergoing for gram patch omentopexy closure were studied. Several factors associated with mortality were taken into consideration such as Age, presence of comorbidities, perforation to operation interval, preoperative shock, heart rate, serum creatinine.

**Jabalpur prognostic scoring system:** Age of 65-74 yeers is given a score of 5 and 6 respectively. Co-morbid conditions if present, it is given a score of 5 (Table 1).

The JPSS (range 0-21) correlated with mortality and morbidity. Patient with score 0-4 has a zero mortality while those having score more than or equal to 15 has 100% mortality rate. Survivors had a lower mean score 4.9 than non-survivors i.e., 12.5. Using a score of 9 as a cut-off for predicting mortality, the Jabalpur system had a sensitivity of 87%, specificity of 85%, positive predictive value of 41% and negative predictive value of 98%.

Singh et al.[18] did a study, in which they have developed a simple prognostic scoring system for typhoid ileal perforation peritonitis, which was based on Jabalpur Prognostic Scoring System (JPSS).

Comparison of morbidity and mortality in peptic perforation peritonitis (PUP, n = 140) and typhoid ileal perforation (TIP, n = 82) (Table 2).

Rathore Mishra did a study regarding the assessment of severity of sepsis using Jabalpur Prognostic Score and its correlation with platelet count

Table 1: Jabalpur prognostic scoring system

| Score | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| P-O interval | <24 Hrs | 25-72 | 73-96 | 97-120 | >120 |
| Mean systemic BP | 70-109 | | 50-69 | 130-159 | <49 |
| | | | 110-129 | | <150 |
| HR | 70-109 | | 55-69 | 40-54 | <39 |
| | | | 110-130 | 140-179 | >180 |
| S.Creat | 0.6-1.4 | | 1.5-1.9 | 2-3.4 | >3.5 |
| Age | <45 | | 45-54 | 55-64 | |

Table 2: Comparison of morbidity and mortality in peptic perforation

| JPSS range | Morbidity in PUP (%) | Morbidity in TIP % (n) | Mortality in PUP (%) | Mortality in TIP % (n) |
|---|---|---|---|---|
| 0-4 | 14 | 36 (12) | 0 (0) | 4.9 (3) |
| 5-9 | 48 | 81.2 (25) | 7 (3) | 56.2 (9) |
| 10-14 | 71 | 100 (5) | 38 (8) | 80 (4) |
| 15-21 | 100 | 100 (1) | 100 (4) | 100 (1) |

at the time of presentation in the patients of perforation peritonitis. Sequential assessment of platelet count on days 1, 3 and 5 was done along with its correlation with outcome. A prospective study model was used with a sample size of 158 patients, with age above 18 years (mean age 40 years) all of who were operated in the institution for perforation peritonitis. In the 158 patients studied mortality was observed after dividing the patients into thrombocytopenic and non-thrombocytopenic groups. The mortality in the thrombocytopenic group was found to be 66.67% and that in the non-thrombocytopenic group was significantly lower at 33.33% with a p = 0.017. It was concluded that decrease in platelet count was associated with increased mortality.

## RESULTS

This study was conducted in the department of general surgery, NSCB medical college and hospital Jabalpur from November 2019-august 2020. Patient of perforation peritonitis were taken.

The study aims at the comparative study of platelets, lymphocytes, eosinophils as a prognostic marker in perforation peritonitis and it's correlation with Jabalpur prognostic scoring system. Study has been based on the analysis of 84 cases of hollow viscous perforation admitted to Netaji Subhash chandra Bose medical college and hospital Jabalpur. Out of 84 cases of perforation peritonitis, all underwent emergency laparotomy. There were Out of 84 cases 83.4% were male and 16.6% were female. Among male and female most common age group affected was 46-55 (25%), mean age of 43.3 +/- SD 15.04 (Table 3 and Fig. 1).

**Result-mean age group:** Out of 84 cases 83.4% were male and 16.6% were female. Among male and female most common age group affected was 46-55 (25%).

Most common site of perforation found to be pre-pyloric in 61.9% male and 10.77% female next most common site observed was ileum in 16.7%male and 1.19% female. Other sites comprises were Gall bladder (1.2%), Duodenum (1.2%), Jejunum (1.2%), Apppendix (1.2%), caecum (1.2%), ascending colon(1.2%), transverse colon (2.4%) (Table 4 and Fig. 2).

Jabalpur prognostic score calculated among these patients over pre-op day, 1st, 2nd, 3rd, 5th and 7th post op days. Score divided in 4 groups <5, 6-10, 11-15, 16-21 (Fig. 3 and Table 5).

On pre-op day 48.8% patients had score <5 and 46.4% had score 6-10 and only 3.6% patients were having score between 11-15 and no patient found having score more than 16.

Table 3: Age group wise distribution

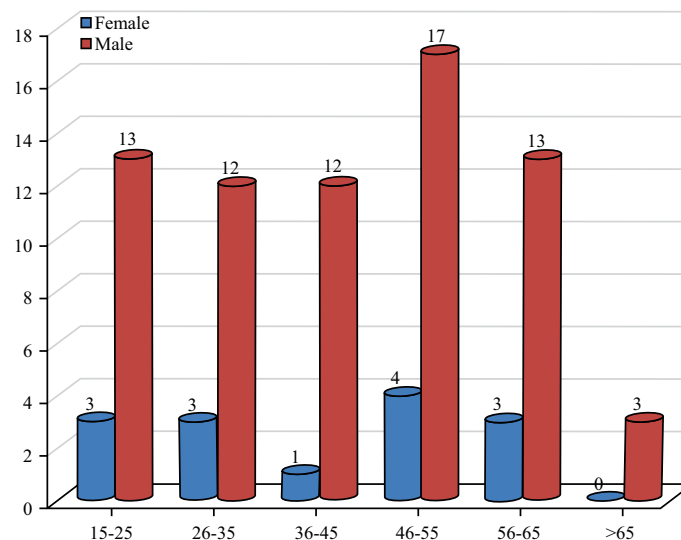| Age group (years) | Female | Male | Total |
|---|---|---|---|
| 15-25 | 3 (3.57%) | 13 (15.47%) | 16 (19.04%) |
| 26-35 | 3 (3.57%) | 12 (14.28%) | 15 (17.85%) |
| 36-45 | 1 (1.19%) | 12 (14.28%) | 13 (15.47%) |
| 46-55 | 4 (4.76%) | 17 (20.23%) | 21 (25%) |
| 56-65 | 3 (3.57%0 | 13 (15.47%) | 16 (19.04%) |
| >65 | 0 | 3 (3.57%) | 3 (3.57%) |
| Total | 14 (16.6%) | 70 (83.4%) | 84 (100%) |



Fig. 1: Age group wise distribution

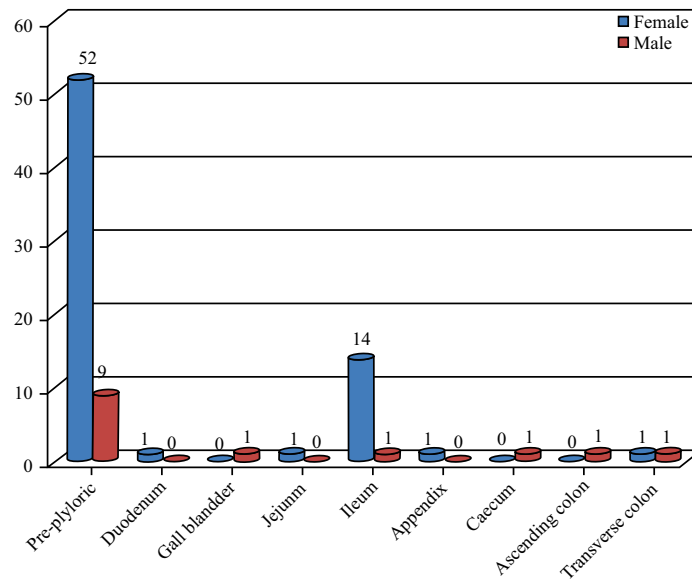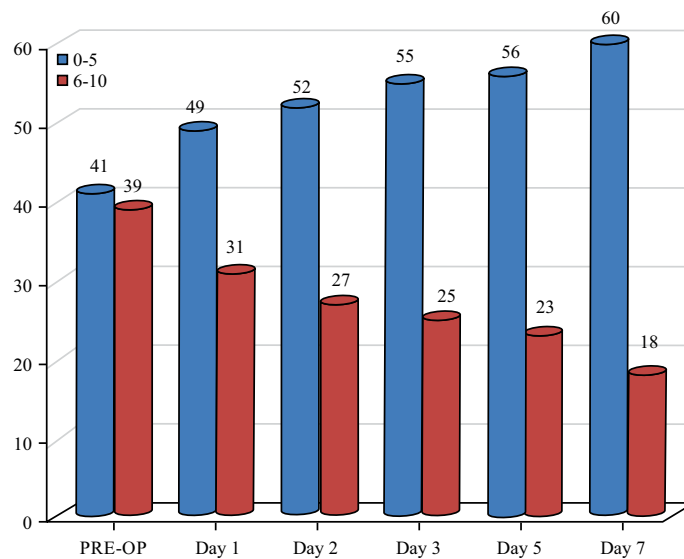Fig. 2: Perforation site wise distribution



Fig. 3: JPS score group wise distribution

Table 4: Perforation site wise distribution

| Perforation site | Male | Female | Total |
|---|---|---|---|
| Pre-pyloric | 52 (61.90%) | 9 (10.77%) | 61 (72.6%) |
| Duodenum | 1 (1.19%) | 0 | 1 (1.19%) |
| Gall bladder | 0 | 1 (1.19%) | 1 (1.19%) |
| Jejunum | 1 (1.19%) | 0 | 1 (1.19%) |
| Ileum | 14 (16.7%) | 1 (1.19%) | 15 (17.9%) |
| Appendix | 1 (1.19%) | 0 | 1 (1.19%) |
| Caecum | 0 | 1 (1.19%) | 1 (1.19%) |
| Ascending colon | 0 | 1 (1.19%) | 1 (1.19%) |
| Transverse colon | 1 (1.19%) | 1 (1.19%) | 2 (2.4%) |

On 1st post op day 58.3% patient had score <5 and patient in score group 6-10 reduced to 36.9% and 3.6% patients were having score between 11-15 and no patient found having score more than 16.

On 2nd post op day 61.9% patient had score <5 and patient in score group 6-10 reduced to 32.1% and 2.4% patients were having score between 11-15 and no patient found having score more than 16.

On 3rd post op day 65.5% patient had score <5 and patient in score group 6-10 reduced to 29.8% and no patient found having score more than 10.
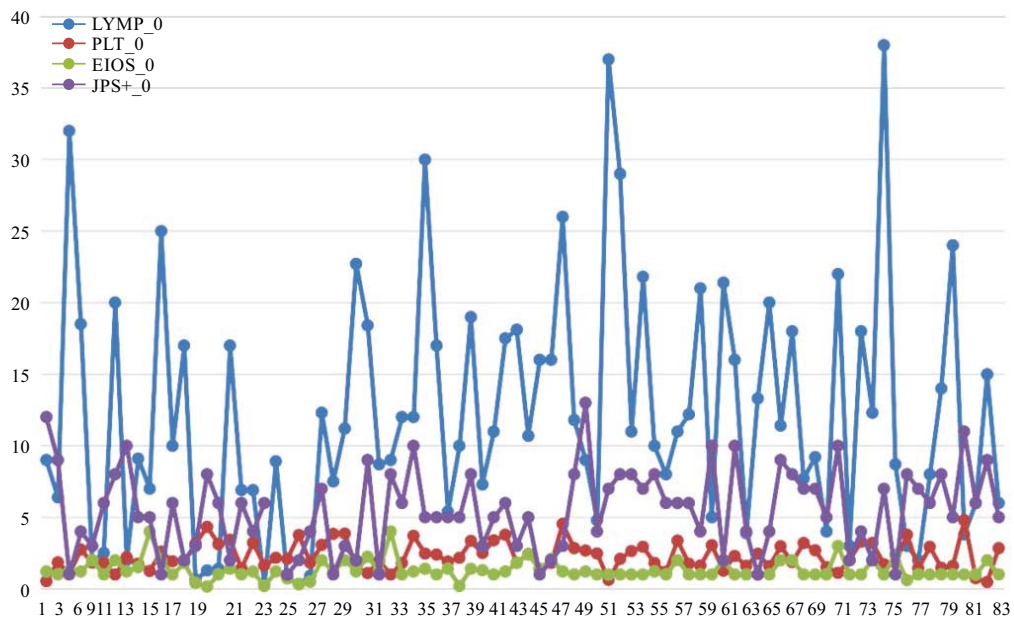
Fig. 4: Pre-operative day values of lymphocyts, eosinophils and platelet count


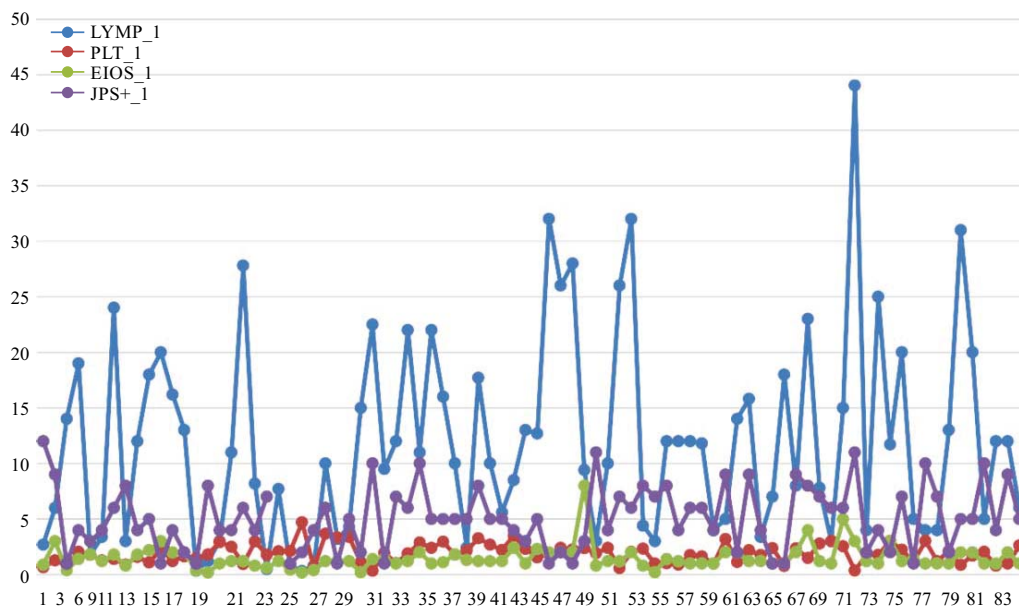
Fig. 5: Post operative day-1 values of lymphocyts, eosinophils and platelet count

On 5th post op day 66.7% patient had score <5 and patient in score group 6-10 reduced to 27.4% and no patient found having score more than 10.

On 7th post op day 71.4% patient had score <5 and patient in score group 6-10 reduced to 21.4% and no patient found having score more than 10.

From Table 4 it can be observed that as post op days passes JPS score decreases.

PRE-operative day graphical presentation of lymphocyts, eosinophils and platelet count.

- 1st post-operative day graphical presentation of lymphocyts, eosinophils and platelet count (Fig. 6)
- 2nd Post-operative day graphical presentation of lymphocyts, eosinophils and platelet count (Fig. 7)
- 3rd post-operative day graphical presentation of lymphocyts, eosinophils and platelet count
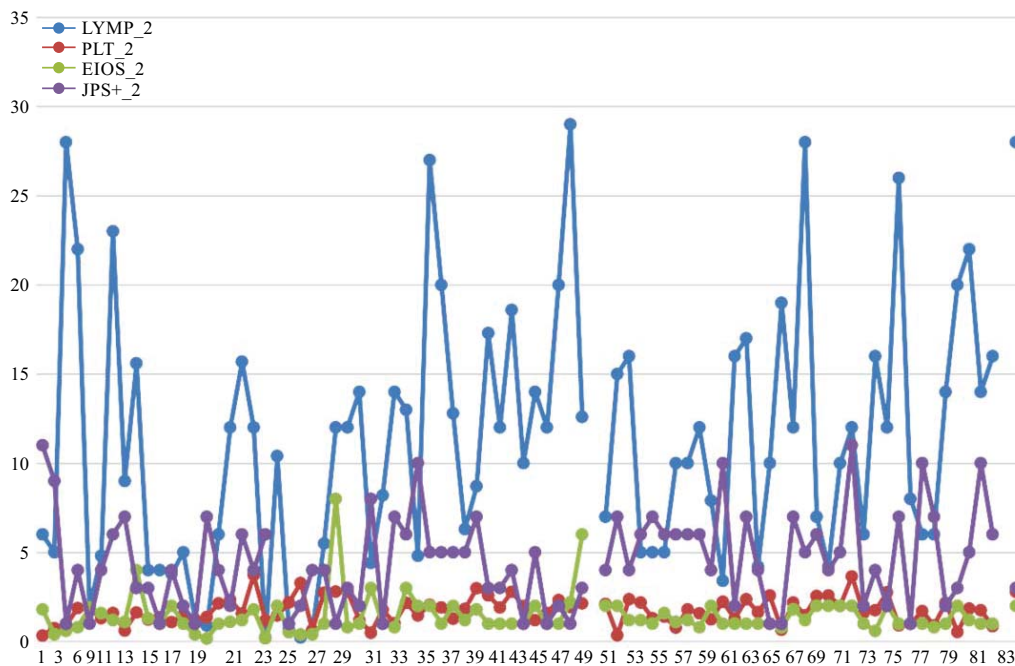- 5th Post-operative day graphical presentation of lymphocyts, eosinophils and platelet count

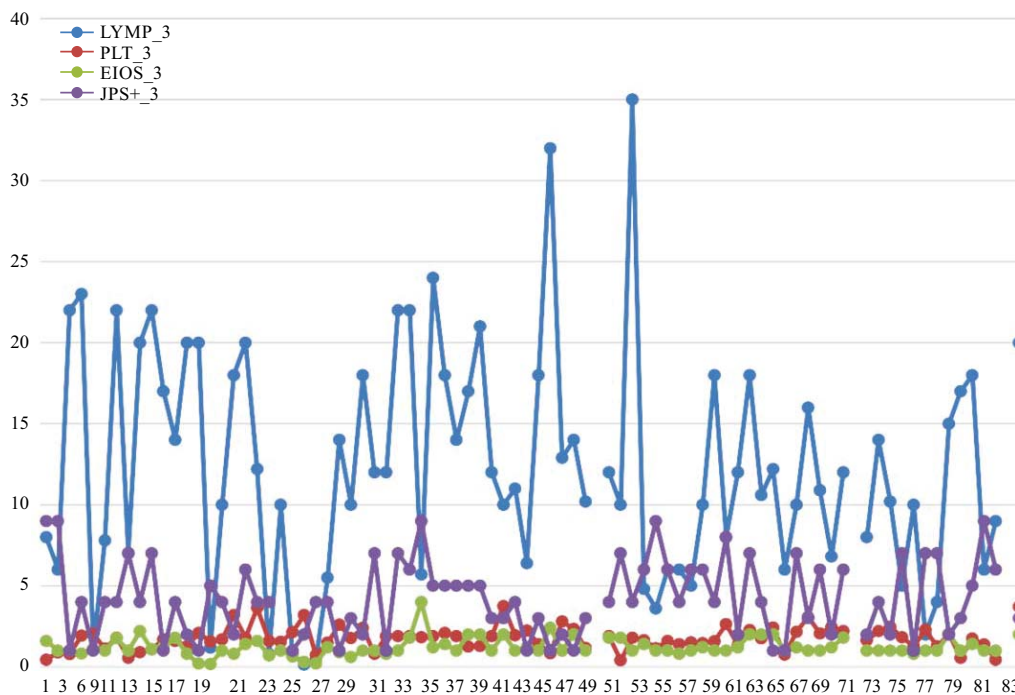Fig. 6: Post-operative day-2 values of lymphocyts, eosinophils and platelet count



Fig. 7: Post-operative day-3 values of lymphocyts, eosinophils and platelet count

Mean values of lymphocytes count, platelets and eosinophils and been taken on pre-op day, post op day-1, day-2, day-3, day-5 and day-7 (Table 5).

It has been observed that On pre-op day mean JPS score was high which has been got lowered in post operative days 1, 2, 3, 5 and 7.

Lymphocytes count were high on preoperative days which after operation lowered in day1 and day-2 and after 2nd post operative day lymphocytes mean value improved afterwards.

Platelet counts have also observed to be on higher average side on pre- operative day as compared to post operative days and shown decreasing mean value till 2nd post operative day. Platelet mean value improved after 2nd post operative day and on rising values thereafter.
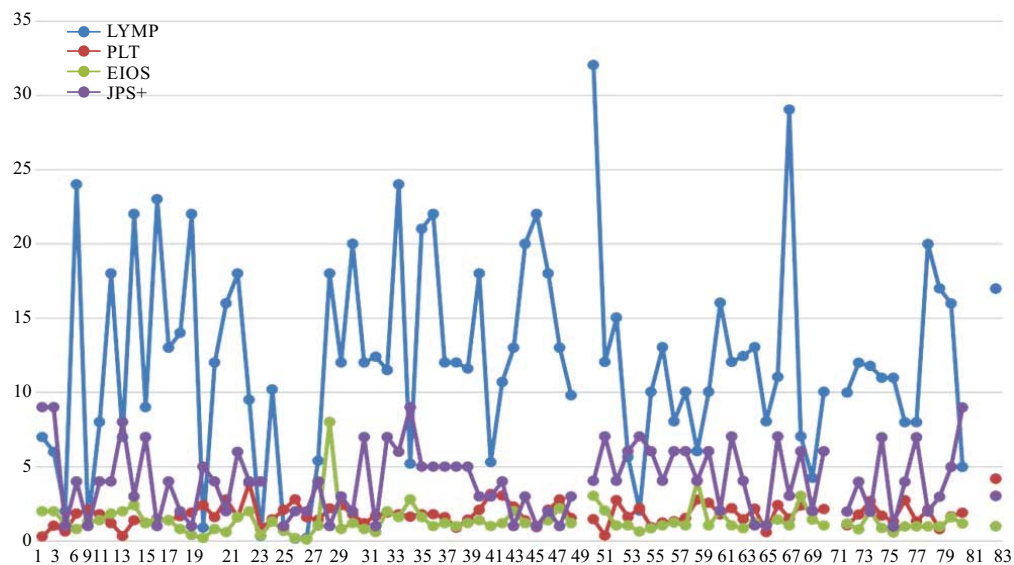
Fig. 8: Post-operative day-5 values of lymphocyts, eosinophils and platelet count

Table 5: JPS score group wise distribution

| JPS | 0-5 | 6-10 | 11-15 | 16-21 |
|---|---|---|---|---|
| PRE-OP | 41 (48.8%) | 39 (46.4%) | 3 (3.6%) | - |
| Day1 | 49 (58.3%) | 31 (36.9%) | 3 (3.6%) | - |
| Day2 | 52 (61.9%) | 27 (32.1%) | 2 (2.4%) | - |
| Day3 | 55 (65.5%) | 25 (29.8%) | - | - |
| Day5 | 56 (66.7%) | 23 (27.4%) | - | - |
| Day7 | 60 (71.4%) | 18 (21.4%) | - | - |

Table 6: Mean values of lymphocyts, platelets, eosinophils, jabalpur prognostic score

| | No. | Minimum | Maximum | Mean | Standard deviation |
|---|---|---|---|---|---|
| LYMP_0 | 84 | 0.30 | 38.00 | 12.1880 | 8.48669 |
| LYMP_1 | 84 | 0.33 | 44.00 | 11.9569 | 8.98758 |
| LYMP_2 | 82 | 0.23 | 29.00 | 11.3409 | 7.27863 |
| LYMP_3 | 81 | 0.14 | 35.00 | 12.2990 | 7.13235 |
| LYMP_5 | 80 | 0.16 | 32.00 | 12.0780 | 6.75772 |
| LYMP_7 | 78 | 0.20 | 26.00 | 12.5640 | 6.12663 |
| PLT_0 | 84 | 0.48 | 4.80 | 2.2867 | .95369 |
| PLT_1 | 84 | 0.35 | 4.70 | 1.9211 | .86078 |
| PLT_2 | 82 | 0.33 | 3.73 | 1.7412 | .74117 |
| PLT_3 | 81 | 0.40 | 3.75 | 1.7659 | .72887 |
| PLT_5 | 80 | 0.30 | 4.20 | 1.7809 | .72946 |
| PLT_7 | 78 | 0.40 | 4.98 | 1.9723 | .82018 |
| EOS_0 | 84 | 0.15 | 4.00 | 1.3148 | .67378 |
| EOS_1 | 84 | 0.18 | 8.00 | 1.4927 | 1.07702 |
| EOS_2 | 82 | 0.16 | 8.00 | 1.4530 | 1.10980 |
| EOS_3 | 81 | 0.18 | 4.00 | 1.2281 | .56703 |
| EOS_5 | 80 | 0.10 | 8.00 | 1.3643 | 0.99903 |
| EOS_7 | 78 | 0.20 | 5.00 | 1.2596 | 0.71437 |
| JPS+_0 | 83 | 1.0 | 13.0 | 5.542 | 2.88940 |
| JPS+_1 | 83 | 1.0 | 12.0 | 5.133 | 2.84890 |
| JPS+_2 | 81 | 1.0 | 11.0 | 4.519 | 2.65570 |
| JPS+_3 | 80 | 1.0 | 9.0 | 4.213 | 2.34760 |
| JPS+_5 | 79 | 1.0 | 9.0 | 4.076 | 2.29140 |
| JPS+_7 | 78 | 1.0 | 10.0 | 3.910 | 2.25740 |

Eosinophils count mean value have not shown any variation with JPS as well as platelets and lymphocytes counts and have maintained almost constant average value on pre and post operative days (Table 6).

## DISCUSSIONS

The study aims at the comparative study of platelets, lymphocytes, absolute eosinophils count (AEC) as a prognostic marker in perforation peritonitis and it's correlation with Jabalpur prognostic scoring system (JPSS).

Many research and educational programs are being done at national and international level to improve the outcome of severe sepsis. On the other hand, the developing countries are struggling in many ways to identify the patients as high risk and to treat them with intensive therapy since the resources are limited.

JPS was identified first and used, in response to this need since it does not use expensive investigations, considering it to be a user-friendly risk stratification scoring system and can be used at a wider scale.

This study was based on observing the parameters of 84 patients, cases of hollow viscous perforation admitted to Netaji Subhash Chandra Bose medical college and hospital Jabalpur. There are 83.4% were male and 16.6% were female. Among male and female most common age group affected was 46-55 (25%). mean age 43.3 +/-SD 15.047. Most common site of perforation found to be pre-pyloric in 61.9% male and 10.77% female next most common site observed was ileum in 16.7% male and 1.19% female. Other sites comprise were Gall bladder (1.2%), Duodenum (1.2%), Jejunum (1.2%), Appendix (1.2%), caecum (1.2%), ascending colon (1.2%), transverse colon (2.4%).

JPS score calculated on pre-operative day, post operative day 1, 2, 3, 5, and 7. JPS score was <5 in 48.8, 58.3, 61.9, 65.5, 66.7 and 71.4% patients on preoperative day, post-operative day 1, 2, 3, 5 and 7, respectively. The JPS score was 6-10 in 46.4, 36.9, 32.1, 29.8, 27.4 and 21.4% patients on preoperative day, post operative day 1, 2, 3, 5 and 7, respectively. JPS score was 11-15 in 3.6, 3.6 and 2.4%, patients on preoperative day, post operative day 1, 2 and 3, respectively.

Similar study has been done by Rathore Mishra regarding the assessment of severity of sepsis using Jabalpur Prognostic Score and its correlation with platelet count at the time of presentation in the patients of perforation peritonitis. Sequential assessment of platelet count on days 1, 3 and 5 was done along with its correlation with outcome. A prospective study model was used with a sample size of 158 patients, with age above 18 years (mean age 40 years) Most common site of perforation found to be pre-pyloric in 61.9% male and 10.77% female next most common site observed was ileum in 16.7% male and 1.19% female. Other sites comprises were Gall bladder (1.2%), Duodenum (1.2%), Jejunum (1.2%), Apppendix (1.2%), caecum (1.2%), ascending colon (1.2%), transverse colon (2.4%). In this study it was concluded that decrease in platelet count was associated with increasing sepsis.

In our study platelets, lymphocytes and Absolute eosinophil count were observed and correlated among themselves and with each other, on pre-op day, post op days 1, 2, 3, 5 and 7. Platelet count, lymphocyte count and eosinophils count have been correlated with among themselves and with each other on pre-operative days and post operative day.

In this study platelets count have shown rising trend as post operative days passes without any significant variation. Same trend has also seen in lymphocyte count after second post operative day with persistent rise in mean value of it, without any significant variation. Absolute eosinophil count has shown very minimal, irregular, statistically not significant change as post op days passed. This shows among platelets, lymphocytes and eosinophil, platelet

count and lymphocytes can be used as a reliable marker in early detection of sepsis. As proven by improvement in JPS score in post operative days. In the post operative period the trend was there is increase in lymphocyte count followed by platelet count in successive post op days but no clear cut define co-relation was observed with change in AEC.

## CONCLUSION

This was a prospective observational study conducted in the Department of Surgery, Netaji Subhash Chandra Bose Medical College and hospital, Jabalpur, Madhya Pradesh. Total 84 patients who underwent surgery for hollow viscus perforation peritonitis between November 2019 to August 2021 were included in the study. The study aims at the comparative study of platelets, lymphocytes, absolute eosinophils count (AEC) as a prognostic marker in perforation peritonitis and it's correlation with Jabalpur prognostic scoring system (JPSS). From this study we concluded that. In the study, 83.4% were male and 16.6% were female, most common age group affected was 46-55 (25%). mean age 43.3 +/-SD 15.047. -Most common site of perforation found to be pre-pyloric in 61.9% male and 10.77% female next, was ileum in 16.7%male and 1.19% female. Other sites comprise were Gall bladder (1.2%), Duodenum (1.2%), Jejunum (1.2%), Appendix (1.2%), caecum (1.2%), ascending colon (1.2%), transverse colon (2.4%). JPS calculated on pre-operative day, post operative day 1,2,3,5 and 7, respectively. JPS was <5 in 48.8, 58.3, 61.9, 65.5, 66.7 and 71.4% patients on preoperative day, post operative day 1, 2, 3, 5 and 7, respectively. JPS was 6-10 in 46.4, 36.9, 32.1, 29.8, 27.4 and 21.4% patients on preoperative day, post operative day 1, 2, 3, 5 and 7, respectively. JPS was 11-15 in 3.6, 3.6 and 2.4%, patients on pre-operative day, post operative day 1, 2 and 3, respectively. In this study platelets count have shown rising trend as post operative days passes without any statistically significant variation. Same trend has also seen in lymphocyte count after second post operative day with persistent rise in mean value of it, without any statistically significant variation. Absolute eosinophil count has shown very minimal, irregular, statistically not significant change as post op days passed. Among platelets, lymphocytes and eosinophil, platelet count and lymphocytes can be used as a reliable marker in early detection of sepsis.

As proven by improvement in JPS in post operative days. In the post operative period there was increasing trend in lymphocyte count followed by platelet count in successive post op days but no clear cut-definite co-relation was observed with change in AEC.

Platelets count, lymphocyte count can be used as predictive markers in case of perforation peritonitis patient as they are routinely performed in small health

care centers and does not entail any extra effort or expenditure. Hence platelets and lymphocytes count have ease and cost effectiveness for sepsis.

However, Larger study with a greater number of patients will be required to validate the study.

## REFERENCES

1.  Jhobta, R.S., A.K. Attri, R. Kaushik, R. Sharma and A. Jhobta, 2006. Spectrum of perforation peritonitis in India-review of 504 consecutive cases. World J. Emerg. Surg., Vol. 1. 10.1186/1749-7922-1-26.

2.  Mishra, A., D. Sharma and V.K. Raina, 2003. A simplified prognostic scoring system for peptic ulcer perforation in developing countries. Indian J. Gastroenterol., 22: 49-53.

3.  Proctor, M.J., D.S. Morrison, D. Talwar, S.M. Balmer and C.D. Fletcher *et al.*, 2011. A comparison of inflammation-based prognostic scores in patients with cancer: A glasgow inflammation outcome study. Eur. J. Cancer, 47: 2633-2641.

4.  Brunkhorst, F.M., K. Wegscheider, Z.F. Forycki and R. Brunkhorst, 2000. Procalcitonin for early diagnosis and differentiation of sirs, sepsis, severe sepsis and septic shock. Intensive Care Med., 26: S148-S152.

5.  Cuschieri, A., P.A. Grace, A. Darzi, N.R. Borley and D.I. Rowley, 2012. Clinical Surgery. 2n Edn., Edn., Wiley-Blackwell, ISBN-17: 978-1-118-34395-1, Pages: 832.

6.  Julius, Z., 0. Ueber das vorkommen der eosinophilen zellen in menschlichen blute. Z Klin Med., 23: 227-308.

7.  Harlow, C.M. and H. Selye, 1937. The blood picture in the alarm reaction. Exp. Biol. Med., 36: 141-144.

8.  Gil, H., N. Magy, F. Mauny and J.L. Dupond, 2003. Value of eosinopenia in inflammatory disorders: An "old" marker revisited. La Revue Médecine Interne, 24: 431-435.

9.  Aouifi, A., V. Piriou, O. Bastien, P. Blanc and H. Bouvier *et al.*, 2000. Usefulness of procalcitonin for diagnosis of infection in cardiac surgical patients. Crit. Care Med., 28: 3171-3176.

10. Makkar, N., S. Sharma, S. Singh, A. Kumar and M. Sandhu, 2016. Assessment of severity of peritonitis using mannheim peritonitis index. Niger. J. Surg., Vol. 22. 10.4103/1117-6806.189009.

11. Wilson, J., P. Neame and J. Kelton, 1982. Infection-induced thrombocytopenia. Seminars Thrombosis Hemostasis, 8: 217-233.

12. Corrigan, J.J., W.L. Ray and N. May, 1968. Changes in the blood coagulation system associated with septicemia. New Engl. J. Med., 279: 851-856.

13. Oppenheimer, L., W.M. Hryniuk and A.J. Bishop, 1976. Thrombocytopenia in severe bacterial infections. J. Surg. Res., 20: 211-214.

14. Riedler, G.F., P.W. Straub and P.G. Frick, 1971. Thrombocytopenia in septicemia. A clinical study for the evaluation of its incidence and diagnostic value. Helv. Med. Acta., 36: 23-38.

15. Neame, P.B., J.G. Kelton, I.R. Walker, I.O. Stewart, H.L. Nossel and J. Hirsh, 1980. Thrombocytopenia in septicemia: The role of disseminated intravascular coagulation. Blood, 56: 88-92.

16. Corrigan, J.J., 1974. Thrombocytopenia: Alaboratory sign of septicemia in infants and children. J. Pediatr., 85: 219-221.

17. Mishra, A., D. Sharma and V.K. Raina, 2003. A simplified prognostic scoring system for peptic ulcer perforation in developing countries. Indian J. Gastroenterol., 22: 49-53.

18. Singh, H., A. Mishra, D. Sharma and U. Somashekar, 2010. A simple prognostic scoring system for typhoid ileal perforation peritonitis. Trop. Doctor, 40: 203-207.