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A Prospective Study Of Prognostic Scoring Systems For Predicting 30-Day Mortality In Perforated Peptic Ulcer Patients In A Tertiary Care Centre, Jnims, Imphal

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ABSTRACT:
Perforation is a complicationin Peptic ulcer Disease which comes with a high rate of morbidity and mortality. Early detection and early intervention is warranted for a favourable outcome.

Objective- The main aim was to search for a clinically feasible scoring system to prognosticate the 30-day mortality in patients with peptic ulcer perforation.

Material and methods- It is a prospective study conducted at the General surgery department of a tertiary care centre of Jawaharlal Nehru Institute of Medical Sciences at Imphal over a period of 2 years from 1st September 2022 till 31st August 2024. 51 patients were evaluated.

Results- Mortality rate in our study is 13.7%. Elderly age (>60 years), use of steroids, presence of co-morbidities like cirrhosis, active malignancy, late presentation, deranged serum creatinine and high ASA grade(>3) were identified as high-risk factors. The Area under curve for mortality prediction was 0.843 for ASA and 0.971 for PULP score.

Conclusion- Though ASA is more user-friendly, PULP score proves to be more precise and covers wider range of risk factors to predict mortality.

Keywords- Perforation, 30-day mortality, risk factors.

I. INTRODUCTION

Perforation is the second most common complication of peptic ulcer[1], complicating 2-10% of peptic ulcers[2], where morbidity and mortality may reach up to 50% and 25% respectively.[3] In treatment of peptic ulcer, incidence of elective surgery tended to decrease due to eradication of Helicobacter pylori during the recent three decades whereas incidence of emergency surgical interventions for complications of the disease did not decrease4-6. Population ageing and extensive use of non-steroidal anti-inflammatory drugs increased the incidence of bleeding and perforation of peptic ulcer.[4]

Several scoring systems have been proposed for the prediction of 30-day Mortality and Morbidity of perforated peptic ulcer (PPU) in order to risk stratify patients subject to their anticipated complications and accordingly direct the required attention to high-risk patients.Many scoring systems were used to predict outcome in PPU and among them ASA score, Boey's score, MPI and PULP have found to have moderate accuracy of predicting mortality with area under the Receiver Operative Curve (ROC) of 72%-77.2%.[5] Mortality is a serious complication in PPU. As mentioned before, PPU carries a mortality ranging from 1.3% to 20%.[6,7]Other studies have also reported 30-day mortality rate reaching 20% and 90-day mortality rate of up to 30%.[8,9]Significant risk factors that lead to death are presence of shock at admission, co-morbidities, resection surgery, elderly patients, a delay presentation of more than 24 hrs, metabolic acidosis, acute renal failure, hypoalbuminemia, being underweight and smokers.[8,10,11] The mortality rate is as high as 12%-47% in elderly patients undergoing PPU surgery.[12-14] Patients older than 65 years were associated with higher mortality rate when compared to younger patients (37.7% vs 1.4%).[11] A study involving 06 patients with PPU also showed that there was nine-fold increase in postoperative complications in patients with co-morbidities.[15] In another large population study, patients with diabetes had significantly increased 30-day mortality from PPU. [16]PULP score appears to have the greatest predictability of mortality however it is impractical with its complexity.[17]Boey score is a more practical but its predictability value was found varying in several studies.[17-20] Both scoring systems require a well history taking to detect the duration of symptoms and co-morbidities.[17] Detection of patients with pre-operative PULP score for high risk for mortality, even after PPU surgery can help in planning other treatment modalities like ICU care or can necessitate some extra care protocols to decrease the mortality.[21]

PULP score consists of eight-variable score (range=0-18), based on age>65 years, co-morbid active malignancy or AIDS, co-morbid liver cirrhosis, concomitant use of steroids, shock on admission, time from admission to surgery>24hrs, serum creatinine>130umol/l or 1.47mg/dl and ASA score.[22]

II. MATERIALS AND METHODS

Patients and setting

A prospective study was conducted at the General surgery department of a tertiary care centre of Jawaharlal Nehru Institute of Medical Sciences at Imphal over a period of 2 years from 1st September 2022 till 31st August 2024. 51 patients were evaluated. All cases above 18 years of age presenting with perforated gastric and duodenal ulcer due to benign and cancerous lesions who were operated in the Department of General Surgery, JNIMS, Porompat, Imphal during the study period will be included. Patients presenting with Hollow viscus perforation apart from peptic ulcer perforation, perforation due to malignant etiology and patients managed conservatively were excluded.

Sampling/Method of recruitment:

Universal sampling were done for 51 consecutive patients attending JNIMS hospital in which diagnosis of peptic ulcer perforation is established by operative findings or surgical interventions during management were included in the study as per the inclusionand exclusion criteria. Informed consent were taken from all the patients. All patients were scored under two PPU scoring system- PULP and ASA. Parameters recorded for the PULP score are Age>65years,Co-morbid active malignancy or AID, Co-morbid Liver Cirrhosis, Concomitant use of steroids, Shock on admission, Perforation time on admission>24hrs, Serum Creatinine>1.47mg/dl and ASA class II to V.

THE 30-DAY POST-OPERATIVE COMPLICATION WILL BE ASSESSED IN FOLLOWING OUTCOMES:

PPU treatment is associated with a significant post-operative morbidity and mortality regardless of whether laparoscopic or open repair is performed.40 Post-operative mortality for PPU is estimated to be 6-10%.[23] Age more than 60 years old, delayed treatment greater than 24hours, shock at presentation with systolic blood pressure less than 100mmhg and concomitant diseases are the main risk factors influencing outcome.[24,25] Post-operative mortality in elderly is 3 to 5 times higher.[26] This may be due to the presence of medical co-morbidities, delayed presentation, atypical presentation or delay of >24 hrs in diagnosis.[26]

The most common complications are Surgical Site Infection (32%), respiratory complications (30%), wound Dehiscence (12%), intra-abdominal collection (8.1%), post-operative Fistula (8%), leakage (2.1%) and re-operation (1.2%). Other less common complications are entero-cutaneous fistula, Incisional Hernia and Ileus.

OPERATIONAL DEFINITION:

1.Perforation Time>24hrs-It is the time from perforation (onset of or aggravation of symptoms shown by a classical triad of onset of abdominal pain, tachycardia and abdominal rigidity) to surgery (exploratory laparotomy and omental patch repair) after a confirmative diagnosis of perforation with abdominal X-ray (erect and supine).

2.Age more than 65 as post-operative mortality in age above 65 years have 3-5 times higher.

3.Use of Steroids-[25]

i.anti-inflammatory and analgesic properties of corticosteroids may mask symptoms of gastro-duodenal ulcers and ulcer complications and thus possibly delay diagnosis.

ii.cortico-steroids is considered by majority of physicians as ulcerogenic.

3. Shock on admission defined as systolic blood pressure < 100mmHg and Heart rate> 100 beats/min.

4.Liver Cirrhosis-Peptic ulcer occurs in high frequency in patients with liver cirrhosis. In such patients peptic ulcer is very often asymptomatic and associated with concurrent complications in 29%.[26]

5.Co-morbid active malignancy or AIDS- It causes immune-suppressive condition. Co-morbid active malignancy will include recently detected and on-treatment cancer cases.

6.Perforated Peptic Ulcer (PPU)-includes both perforated gastric and perforated duodenal ulcers.

III. STATISTICAL ANALYSIS:

The data collected will be checked for consistency and completeness. Then the data will be entered in SPSS software version 21.0 and will be presented in Mean and Standard deviation for continuous data, and number and percentage for categorical data.

Pearson's Chi square test was used for categorical data. Odds ratio was calculated for every variable taken into consideration to establish an association.

Univariate and Multivariate analysis was done for pre-operative factors affecting patient outcome,

ASA score and PULP score to check for their association with mortality.
Receiver Operating Characteristics (ROC) curve analysis and Area under Curve (AUC) was calculated for the individual scores and compared. An AUC value >0.8 will be considered good, between 0.6 to 0.8 considered as moderate and <0.6 will be regarded as poor.
P-value of less than 0.05 will be considered statistically significant.

IV. RESULTS

This study was conducted in Jawaharlal Nehru Institute of Health and Medical Sciences (JNIMS) hospital. A total of 51 patients were taken up with particular criteria fixed during the study period.

The highest number of patients encountered in this series were in the age group of 65 years and above (25.4%) followed by age group between 56 and 65 years (19.6%). In this present study, peptic ulcer perforation was more common in the age group of 65 years & above and median age was 52 years. The median age was similar to studies by Thorsen et al (53.6 yrs)[3] and Saafan et al (54.7yrs)[27]. Varying findings were seen in study by Patel et al (42.4 yrs)[28]and by Pasha et al (60.5 yrs)[29].

The ratio of men to women irrespective of site and pathological condition was 16:1 in the present study. Studies done elsewhere in India also shows similar pattern of distribution. A study in western India by Patel et al shows a ratio of 11.5:177 while a study done in capital city by Agarwal et al shows a ratio of 32:193.

Table 1: Demographic profile and it's relation to 30 day mortality.

Parametres	**Outcome after 30 days**		**Total**	**P value**
	Healed	**Death**		
Age (Mean±SD)	48.14±15.18	68.43±6.99		0.001
Age group				
≤60 years	34 (94.4%)	2 (5.6%)	36	
≥60 years	10 (66.7%)	5 (33.3%)	15	
Gender				
Female	2 (66.7%)	1 (33.3%)	3	
Male	42 (87.5%)	6 (12.5%)	48	
Religion				
Christian	20 (87%)	3 (13%)	23	
Hindu	22 (84.6%)	4 (15.4%)	26	
Muslim	2 (100%)	0	2	
BMI	21.08±2.35	19.50±3.33		0.12
Marital Status				
Married	36 (83.7%)	7 (16.3%)	43	
Unmarried	8 (100%)	0	8	
Smoking	37 (88.1%)	5 (11.9%)	42	0.414
Alcohol	36 (90%)	4 (10%)	40	0.140
Co-morbidity	6 (66.7%)	3 (33.3%)	9	0.060
Use of NSAIDs	23 (85.2%)	4 (14.8%)	27	0.811
Use of Steroids	3 (60%)	2 (40%)	5	0.072

In our study, 34 patients (66.6%) were in close vicinity to a tertiary care centre while rest of the 17 patients (33.4%) were located far and initially had seek medical attention from a primary health care centre. Even then only 8 patients (15.6%) presented within 24 hours of initial symptoms, 74.5% patients in between 24 to 72 hours and 5 patients (9.9%) beyond 72 hours of initial presentation. Surapaneni et al demonstrates that the increase in the therapeutic delay was mainly due to a delayed access to the hospital and that the therapeutic delay increases the mortality rate.[30]

Pain abdomen with or without distension, vomiting and fever are the predominant symptoms. Pain abdomen were present in all cases but with different site of presentation. The pain most commonly presented as generalized tenderness in 32 patients (62.7%) followed by pain in the upper middle abdomen in 14 patients (27.4%). Fever was seen in 7 patients (13.7%) and vomiting in 27

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patients (52.9%). Both fever and vomiting were present in 5 patients (9.8%).

On examination, Guarding and rigidity were seen in 47 patients (92.1%), obliteration of liver dullness in 43 patients (84.3%) and absent bowel sounds in 26 patients (50.9%).

Diagnosis of hollow viscus perforation is made clinically and confirmed by the presence of pneumo-peritoneum in X-ray chest and erect-abdomen. Free gas under diaphragm were present in 45 patients (88.2%). Computed Tomography scan were done in 7 patients (13.7%) with clinical suspicion of perforated peritonitis but free gas under diaphragm were not appreciated in X-ray imaging.

Table 2: Pre-operative clinical parameters and their relation to 30 day-mortality

	Outcome after 30 days		Total	P value
	Healed	**Death**		
Time of presentation				
Before 48 hrs	8 (100%)	0	8	
After 24 hrs	21 (87.5%)	3 (12.5%)	24	
After 48 hrs	12 (85.7%)	2 (14.3%)	14	
After 72 hrs	3 (60%)	2 (40%)	5	
Abdominal pain site				
Generalized	26 (81.3%)	6 (18.8%)	32	
Left upper	1 (100%)	0	1	
Right upper	2 (100%)	0	2	
Upper	2 (100%)	0	2	
Upper midline	13 (92.3%)	1 (7.7%)	14	
Vomiting	25 (92.6%)	2 (7.4%)	27	0.164
Fever	4 (57.1%)	3 (42.9%)	7	0.016
Guarding and rigidity	40 (85.1%)	7 (14.9%)	47	0.406
Liver dullness obliteration	36 (83.7%)	7 (16.3%)	51	0.219
Bowel sound	23 (92%)	2 (8%)	25	0.244
Abd. X-ray- Gas under diaphragm	38 (84.4%)	7 (15.6%)	45	0.298
Systolic blood pressure	108.5±15.28	110±23.19		0.801
Diastolic blood pressure	72.90±13.77	66±11.40		0.290
Active malignancy	0	2 (100%)	2	<0.001
AIDS	1 (100%)	0	1	0.687
Liver cirrhosis	2 (66.7%)	1 (33.3%)	3	0.309
Serum creatinine	1.44±0.54	2.48±0.71		0.007

Modified Graham's omental patch repair (MGOPR) was done for 47 patients (92.1%). Gastrojejunostomy and feeding jejunostomy was done for a single patient (1.9%) with a giant gastric perforation. Flank drainage were done for three moribund patients (5.8%).

Intra-operatively, the types of perforations that we came across are Type 3 Gastric perforation in 9 patients (17.6%), Type 5 Gastricperforation in 13 patients (25.4%) and in 1st part of the Duodenum in 26 patients (50.9%). Most of the cases had spillage of Gastric contents in the form of flakes. In one of the patients, we found Giant Gastric perforation.

Image: Anterior Duodenal perforation

In the post-operative period, the complications we faced most commonly were surgical site infection (SSI). Around 26 patients (51%) were admitted for prolonged duration until a secondary suturing was done for them. Respiratory complications in the form of Atelectasis and pulmonary oedema were seen in 12 patients (23.5%). Wound dehiscence secondary to SSI were seen in 15 patients (29.4%). Intra-abdominal collections in 14 patients (27.4%). The patient with the Giant gastric perforation developed post-operative fistula and re- operation was planned to correct the duodenal stump blow out and feeding jejunostomy was done to maintain nutrition.

In terms of outcome within 30 days of operation, 44 patients (86.3%) got healed and 7 patients passed away despite our best effort. So, our mortality rate was 13.7%.

V. DISCUSSION

A. Demographic profile and it's relation to 30-day mortality

The prevalence of peptic ulcer perforation was observed higher in males similar to other studies done in India and abroad.[27,28] It is attributed to habits of smoking and alcohol consumption in young men which continues as a habit. The influence of smoking in duodenal ulcer perforation was studied by Svanes et al (1997) who found that 96% (168/175) of patients were smokers and that smoking increased the risk of ulcer perforation 10-fold in a dose-response relationship.[13] Our study also elicits the habits of smoking and alcohol consumption in our patient population. 42 patients (82.3%) used to smoke or was still smoking when the symptom presented and among them 5 patients (11.9%) passed away (OR=0.473, P value=0.414). 40 patients (78%) used to drink or was still consuming alcohol at time of presentation and 4 patients (10%) passed away (OR=0.296, P value=0.140). Hence a concrete proof cannot be produced to prove that smoking and alcohol consumption can lead to perforation. We recorded peptic ulcer perforation more commonly in age group of above 65 years like other studies.[3,27-29] The odds of death were 8.50 times more if the age of patient was more than 65 years of age in our study which like a study done by Patel et al confirms the finding that elderly suffer from more debilitating morbidity and mortality.[28] The rates of long-term ingestion of NSAIDs and steroids in the current study were 52.9% and 9.8% respectively. Patel et al (8.95% and 4.74%) and Anbalakan et al (1.8% and 0.3%) gave a lower incidence while Agarwal et al (34% and 2%) gave a higher rate. In our study 4 patients (14.8%) using NSAIDs and 2 patients (40%) using steroids succumbed to the perforation. So, we concluded that NSAIDs and steroids ingestion causes 1.2 times and 5.4 times respectively increased chances of mortality.

Table 3: Factors associated with 30 day-mortality

Factors	Odds ratio	95% Confidence interval	P value
Age group->60 yrs	8.50	1.43-50.66	0.019
Gender- male	0.286	0.022-3.65	0.335
BMI	0.759	0.530-1.09	0.133
Smoking	0.473	0.076-2.94	0.422
Alcohol	0.296	0.055-1.592	0.156
Co-morbidity	4.750	0.845-26.71	0.077
Vomiting	0.304	0.053-1.741	0.181
Fever	7.50	1.22-46.10	0.030
Bowel sound	0.365	0.064-2.09	0.257
Use of NSAIDs	1.217	0.243-6.088	0.811
Use of steroids	5.467	0.728-41.03	0.099
Systolic blood pressure	1.008	0.949-1.071	0.795
Diastolic blood pressure	0.693	0.899-1.032	0.290
Liver cirrhosis	0.335	0.274-44.75	0.335
Serum creatinine	14.79	2.271-96.37	0.005
ASA>3	18.22	2.72-121.19	0.003
PULP score	2.041	1.29-3.23	0.002
Duration of hospital stay	1.048	0.96-1.14	0.302

B.Pre-operative clinical parameters and their relation to 30-day mortality.

1.Pre-operative Shock

According to the criteria for shock, 14 patients (27.4%) patients were considered with an odds ratio of 1.008. Hut et al70 and Thorsen et al3 gave a slightly higher co-relation of 2.75 and 2.6 respectively while Patel et al gave a high corelation of 9.2.[28]

2.Serum Creatinine

A significantly higher risk of 30-day mortality (OR=14.79) in patients with raised serum creatinine were observed. Increased serum creatinine level, which is a well-recognized risk factor for mortality in surgical patients, indicates pre-existing renal failure or acute kidney injury due to dehydration or sepsis caused by PPU .[28] Patel et al also gave a similarly high co-relation of 17.[9,28] while Thorsen et al gave a lower co-relation of 3.4. But Saafan et al concluded in his study that there were no significant association with 30-day mortality.[22]

3.Liver cirrhosis

There were 3 patients (5.8%) in our study and 1 patient with mortality (33.3%). The cirrhosis was diagnosed only as intra-operative finding and all three patients were chronic alcoholic. Lehnert et al also in his study shows a associated mortality rate of 35.3% after an emergency surgery was done for perforation.[31]

4.Time interval to intervention

In our study, 43 patients (84.3%) presented to the hospital beyond 24 hrs and among them 24 patients (55.81%) presented within 48 hours, 14 patients (32.5%) within 72 hours and 5 patients (11.6%) beyond 72 hours. This late presentation mostly contributes to the fact that most of the patient were illiterate, daily-wage earners, residing far from a tertiary care centre, wastage of time in root level health care centres waiting for a diagnosis and trial of self-medication. 7 patients (13.7%) died among the patients who presented beyond 24 hours. Thorsen et al in his study gave a mortality rate of 40.9% in patients who presented beyond 24 hours.[3,9]

5.Co-morbid conditions

In our study, we have not done a thorough study on various co-morbid conditions like Hypertension, Diabetes mellitus or Chronic obstructive pulmonary diseases. We stick to presence of active malignancy and HIV-AIDS according to the PULP score. 2 patients (3.8%) were known to have active malignancies at time of presentation. Both patients died giving a 100% mortality rate while AIDS was detected in only 1 patient (1.9%) pre-operatively. Thorsen et al in his study shows a co-relation of 6.4 times mortality rate in patients with known active malignancy.[3,9]

Table 4: Comparison of risk assessment scores and their relation to 30 day-mortality

	Outcome after 30 days		Total	P value
	Healed	**Death**		
ASA grading	1.89±1.13	3.57±1.27		0.012
PULP score	3.84±2.89	11.14±2.55		<0.001
ASA grading				
1	21 (100%)	0	21	
2	13 (86.7%)	2 (13.3%)	15	
3	7 (87.5%)	1 (12.5%)	8	
4	0	2 (100%)	2	
5	3 (60%)	2 (40%)	5	
PULP score				
Age group				
≤60 yrs	34 (94.4%)	2 (5.6%)	36	
>60 yrs	10 (66.7%)	5 (33.3%)	15	
Active malignancy	0	2 (100%)	2	<0.001
AIDS	1 (100%)	0	1	0.687
Liver cirrhosis	2 (66.7%)	1 (33.3%)	3	0.309
Use of steroids	3 (60%)	2 (40%)	5	0.072
Systolic Blood Pressure <100 mmHg	108.05±15.28	110±23.19		0.801
Time of presentation				
After 24 hrs	21 (87.5%)	3 (12.5%)	24	
After 48 hrs	12 (85.7%)	2 (14.3%)	14	
After 72 hrs	3 (60%)	2 (40%)	5	

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Serum creatinine	1.44±0.54	2.48±0.71		0.007
ASA grading				
II	13 (86.7%)	2 (13.3%)	15	
III	7 (87.5%)	1 (12.5%)	8	
IV	0	2 (100%)	2	
V	3 (60%)	2 (40%)	5	

A. Comparison of Risk Assessment scores and their relation to 30-day mortality

In our study, we compared two commonly used scoring systems for predicting mortality in PPU patients. The risk of mortality in patients with higher ASA (>3) and PULP score (>7) were considered higher risk to have mortality within 30 days. Table below shows comparison of various parameters of ASA and PULP score by various authors.

In our study, PULP score got higher AUC and OR value than ASA. Possible explanation can be that inclusion of multiple objective predictors related to patient's current health status and acute disease severity in PULP score as compared to ASA which is based only on pre-existing illnesses.[28] Though ASA is an easy scoring system, it has an inter-observer variability and hence prone to observer bias and since the acute state of the patient is not taken into consideration, it may affect the outcome in terms of mortality. PULP score on the other hand incorporates both ASA grading as well as pre-operative clinical parameters. But the shortcoming of PULP score is that it is more clinically complex and requires exact time of symptom origin and admission for time delay, so it is not user-friendly as ASA.

Table 5: Predictive validity of PULP and ASA score for prediction of 30 day-mortality

Score	AUC	Std. error	P value	95% Confidence interval		Cut-off value	Sensiti -vity	Specifi-city	PPV	NPV
				Lower bound	Upper bound					
ASA	0.843	0.068	0.004	0.709	0.976	>3	57.14%	93.18%	57.14%	93.18%
PULP	0.971	0.021	<0.001	0.929	1.000	>7	71.43%	95.45%	71.43%	95.45%

Image 2: Predictive validity of ASA score for prediction of 30 day-mortality

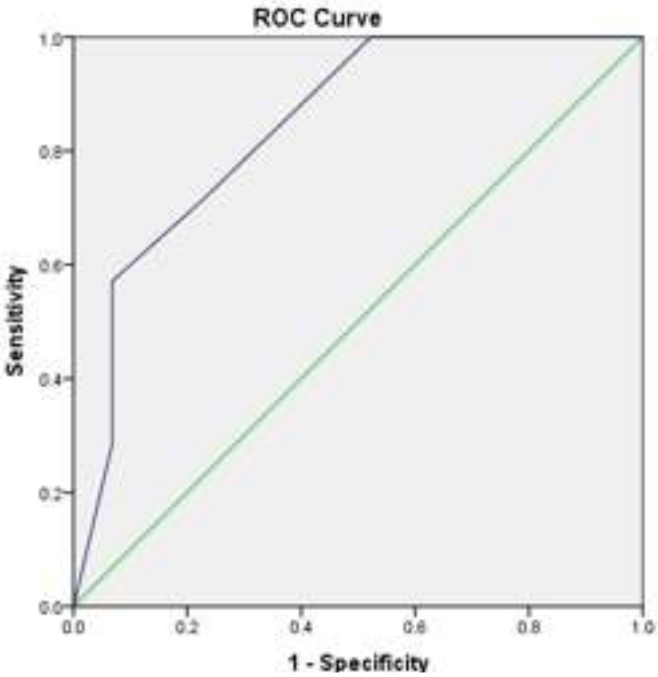

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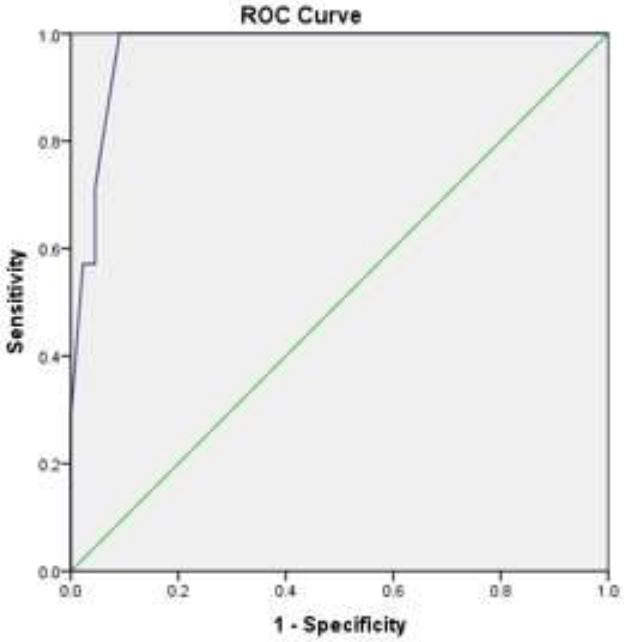
Image 3: Predictive validity of PULP score for prediction of 30 day-mortality



An ideal scoring system needs to be an effective diagnostic indicator for identifying complex cases, and the AUC reflects a score's accuracy, its discriminatory ability to correctly classify patients. To prevent any bias in the comparison of AUC values between two studies with variable demographic profile and study inclusion criteria, ROC curve analysis was done, and AUC values of studies carried out in similar group of patients. In our study, PULP score showed higher AUC, specificity as well as sensitivity. Also, the multivariable regression analysis showed that PULP was the only significant factor in predicting post PPU 30-day mortality.

LIMITATIONS OF THE STUDY: -

1. The sample size was relatively small in comparison to other studies.
2. Individual factors like H. pylori infection, Hypoalbuminemia, Hyperbilirubinemia and Anaemia were not studied.
3. Pre-operative co-morbidities like Hypertension, Diabetes mellitus, COPD etc were not independently evaluated for their relationship with mortality.
4. We did not examine other potential biomarkers like platelet to lymphocyte ratio, neutrophil to lymphocyte ratio, procalcitonin, etc. for predicting mortality.

ETHICAL ISSUES:

Informed written consent will be obtained from the patients before inclusion in the study. Any unwillingness to undergo any investigations will be respected and the subject will be excluded from the study. Even after giving the consent, the subjects reserve the rights to refuse any investigations at any time during the study. Treatment plan of the patients will not be altered in any way to facilitate intake into our study. Approval of the Institute's ethical Committee will be sought.

VI. SUMMARY

A Prospective analytical study to predict outcome of patients with Peptic Ulcer Perforation using Peptic Ulcer Perforation (PULP) score will be conducted in the Department of General Surgery, JNIMS, Porompat, Imphal East, Manipur from 1st September 2019 to 31st August 2021.

A Minimum of 50 consecutive patients with Peptic Ulcer Perforation treated surgically in JNIMS Hospital will be included in the study as per the inclusion and exclusion criteria. The highest incidence of peptic ulcer perforation was observed in the age group of >65 years and male to female ratio of 16:1. Duodenal (Anterior D1) perforation (50.9%) had higher incidence than Gastric perforation.

The most common procedure done was Modified Graham's omental patch repair.

This study will assist in accurate and early identification of high-risk patients, assist in stratification and triage of the patients and thus helps to decide a risk-based management.

VII. CONCLUSION

PULP score is a disease specific, clinically oriented scoring system for predicting mortality in patients with peptic-ulcer perforation.

This study was done to validate the PULP score which is used to predict mortality within 30 days post peptic ulcer perforation while comparing its performance against a commonly used scoring system i.e., ASA.

Among the various parameters of the scoring system, Age> 65 years, presence of active malignancy, use of steroids, perforation time-interval and acute kidney injury (raised serum creatinine) had a significant role in predicting the outcome of the patients. Age> 65 years had the maximum weightage on predicting outcome clinically and the acute kidney injury (raised serum creatinine) systematically.

All patients were assessed and scored using both ASA and PULP scoring system. An outcome is considered 'High' risk if ASA score is more than 3 and PULP score is more than 7. A significant correlation can be established by calculating Odds ratio.

In this study, mortality was zero percent in patient group with PULP score of less than 7 but when PULP score was more than 7, mortality rate increases to 13.7%.

Increasing PULP score is associated with poorer prognosis, prolonged admission in Intensive care unit, higher complication rate, need for vasopressor support and dependency on parenteral nutrition. Gender, NSAIDs or steroids and shock at presentation had no role in mortality risk prediction.

PULP score had higher AUC against ASA reflecting higher accuracy. So, the PULP score, although more complex, predicted mortality risk better than the ASA score.

This study confirmed the importance of mortality risk prediction models in assessing the patients of perforated peptic ulcer in Manipur, a north-eastern state in India.

A larger study comparing more mortality risk factors should be done to help identify risk factors in a wide variety of patients presenting with perforated peptic ulcer and aid in improved risk estimation.

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