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Research Article

**IDENTIFICATION OF A NOVEL PROGNOSTIC SCORING
SYSTEM AS A POSITIVE PREDICTOR OF MORBIDITY AND
MORTALITY IN THE PERFORATED DUODENAL ULCER
PATIENTS**²Dr. Zarnab Aas, ²Dr. Pakiza Ishfaq, ¹Dr. Zahida Shaukat²Allama Iqbal Medical College Lahore¹WMO, THQ Hospital Hassanabdal, Attock**Abstract:**

Objective: We aimed at the prognostic factors identification in the patients of perforated duodenal ulcer and also aimed at the assessment and suggestion of novel scoring system.

Methods: Our research was completed in the timeframe of April, 2016 to October, 2016 at Services Hospital, Lahore. We completed this research in two different phases with different timeframes on the perforated duodenal ulcer patients who were identified in the timeframe of thirty days with the predicting factors prognosis. Severity level was used for the scoring system of the predictive factor with the help of modern scoring system and Univariate analysis was performed through Chi-square testing. Forward step by step progression was used for the multivariate analysis. We also calculated the new scoring system accuracy with the help of curve analysis and validated it in the last study phase.

Results: Poor prognosis predictors were largest perforation size above (0.5 cm), multiple gut perforations, peritoneal fluid amount above (1000 ml), complications development, simple closure, autumn/ winter seasonal presentation and postoperative systemic septicemia. Thirty-two cases presented an overall mortality rate of thirty days (32.3%) and 21 cases of morbidity (21.2%). Poor prognosis cases were observed with higher scores with significant P-value of (0.001). Similarly, grave prognosis cases were also observed with great scores with significant P-value as (0.001). An overall sensitivity and specificity was respectively 85.12% and 80.67%, which can be compared with the other systems of scoring.

Conclusion: New scoring system is considered as a helpful and useful instrument for the prediction of thirty days prognosis for the patients of acid peptic disease and perforated duodenal ulcers.

Keywords: Ulcer, Duodenal Perforation, Peptic Acid, Prognosis, Mortality and Morbidity.

Corresponding Author:**Dr. Zarnab Aas,**Allama Iqbal Medical College,
Lahore

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INTRODUCTION:

Gastrointestinal tract perforation causes a global surgical emergency known as Peritonitis. The perforation etiology spectrum varies in West from its Eastern counterpart [1]. A number of cases are presented late having septicemia and purulent peritonitis [2] The surgical intervention in the perforation peritonitis cases is very challenging. Outcomes have been improved through combined surgical techniques, intensive care and antimicrobial therapy [3]. Perforation and Peptic ulcer bleeding are among the repeated emergencies of the medical field, thirty days mortality is observed in bleeding ulcers and perforation is observed as 10% and about 25% – 40% respectively [4]. Overall mortality and life threatening incidence is associated with perforated peptic ulcers that ranges from 10 – 15 percent [5]. Recent years there have been a fall in the global peptic ulcer disease ratio but it is still substantial [6]. Perforated duodenal ulcer and suture closure is among the emergencies which is contaminated causing post-operative complications such as pneumonia, wound sepsis, paralytic ileus, shock renal failure, septicemia, duodenal fistula, electrolyte imbalance, burst abdomen and intrabdominal abscess [7].

Abdominal surgery morbidity has been reported; moreover, accuracy in the scoring system is deficient for the intraoperative parameters to predict mortality [6, 8]. Sophisticated investigation is one of the scoring system limitation in the under developed countries [9]. We, therefore, aimed at the prognostic factors identification in the patients of perforated duodenal ulcer and also aimed at the assessment and suggestion of novel scoring system.

PATIENTS AND METHODS:

Our research studied 99 cases in the timeframe of April, 2016 to October, 2016 at Services Hospital, Lahore. We identified morbidity and mortality prospective in ninety-nine cases with scoring system predictor on fifty consecutive patients. Detailed history of acid peptic disease and duodenal ulcer, pneumoperitoneum and peritonitis evidence were carried out. We included every case with discrimination of gender and age with hemodynamically stable and systemic sepsis absence presentation. A definite diagnosis was made on the basis of laparotomy exploration with the identification of duodenal perforation. Every new perforation cause was not considered through peritoneal biopsy, culture and ascitic fluid assessment [9 – 11]. Definite diagnosed cases were made a part of this study.

We did not include all the breastfeeding and pregnant women, non-surgical managed patients, related reasons of the perforation and poorly managed major disease cases (renal failure, cardiorespiratory disease, hepatic precoma and diabetes mellitus) [10].

We examined pre-operative features which were potentially associated with the mortality and morbidity such as age, gender, chronic ulcer symptoms duration and seasonal presentation. In the intra-operative parameters gut perforations, largest perforation size, peritoneal contamination extent and operation type were included; whereas, in the post-operative parameters systemic sepsis progression and separate predictors complications were included. Thirty days follow-up was carried out to identify mortality and morbidity.

High risk cases were managed with adequate resuscitation and through midline incision, laparotomy was carried out and intervention was done after the identification of the site. We also obtained peritoneal fluid and culture for the onward assessment. Layer by Layer closing of the abdomen was carried transversely with interrupted suture of (1 / 0 or 2 / 0) catgut. Management of the complications was also addressed accordingly.

Seasonal presentation was classified as autumn/ winter and spring/ summer with the climactic conditions [12, 13]. Predictive model was made on the basis of the positive predictions in Phase – I (Observational). To validate model on fifty cases we applied phase – 2 (Validation). Severity level was used for the scoring system of the predictive factor with the help of modern scoring system and Univariate analysis was performed through Chi-square testing. Forward step by step progression was used for the multivariate analysis. We also calculated the new scoring system accuracy with the help of curve analysis and validated it in the last study phase.

Score was described by using PEDURS-m and PEDURS-M on intraoperative parameters basis which assessed the morbidity and mortality to assess surgical risk factor; whereas, PEDURSS-m and PEDURSS-M assessed post-operative sepsis development.

With the help of constructed score patient's mortality and morbidity were assessed on the basis of cut-off values respectively. PEDURS stands for (Perforated Duodenal Ulcer Risk Stratification); whereas, PEDURSS for (Perforated Duodenal Ulcer Risk Stratification Sepsis). Capital "M" and small "m" respectively for mortality and morbidity. Accuracy

was measured through specificity and sensitivity. SPSS was used for the data outcomes analysis.

RESULTS:

Poor prognosis predictors were largest perforation size above (0.5 cm), multiple gut perforations, peritoneal fluid amount above (1000 ml), complications development, simple closure, autumn/winter seasonal presentation and postoperative systemic septicemia. Thirty-two cases presented an overall mortality rate of thirty days (32.3%) and 21

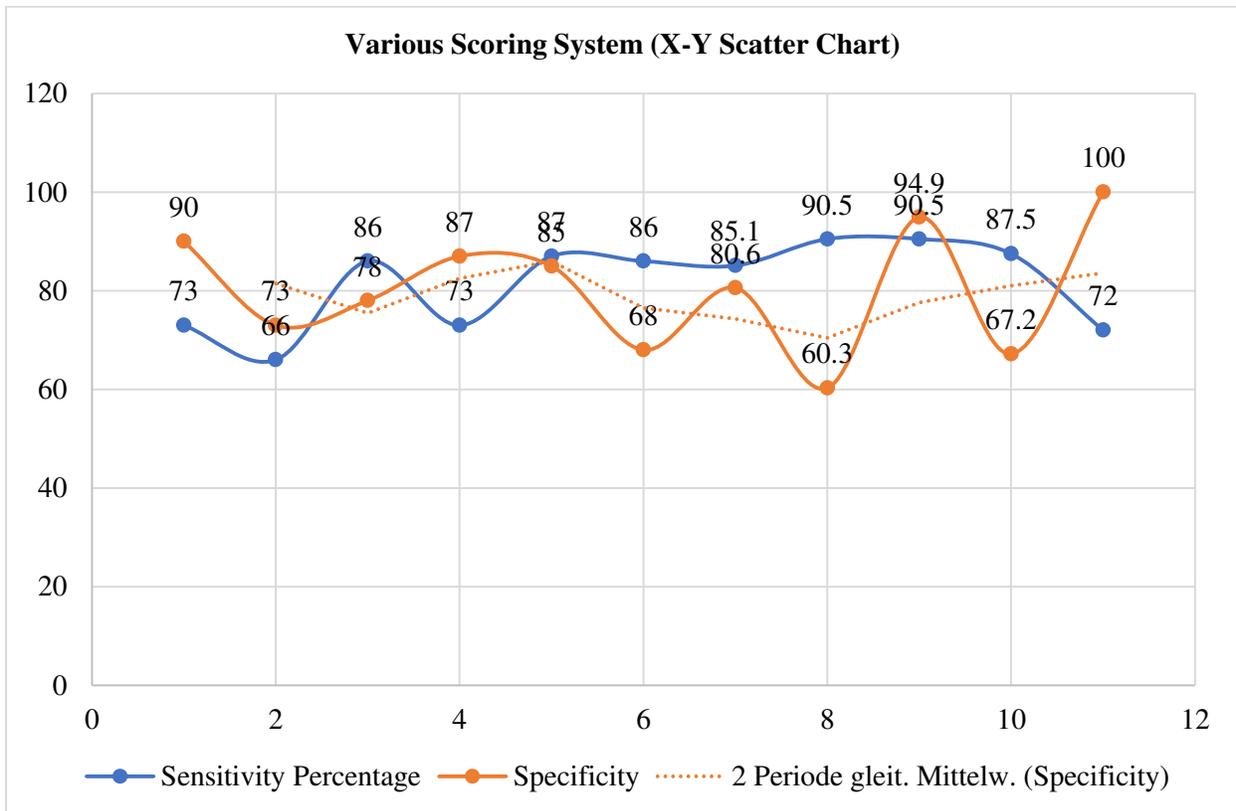
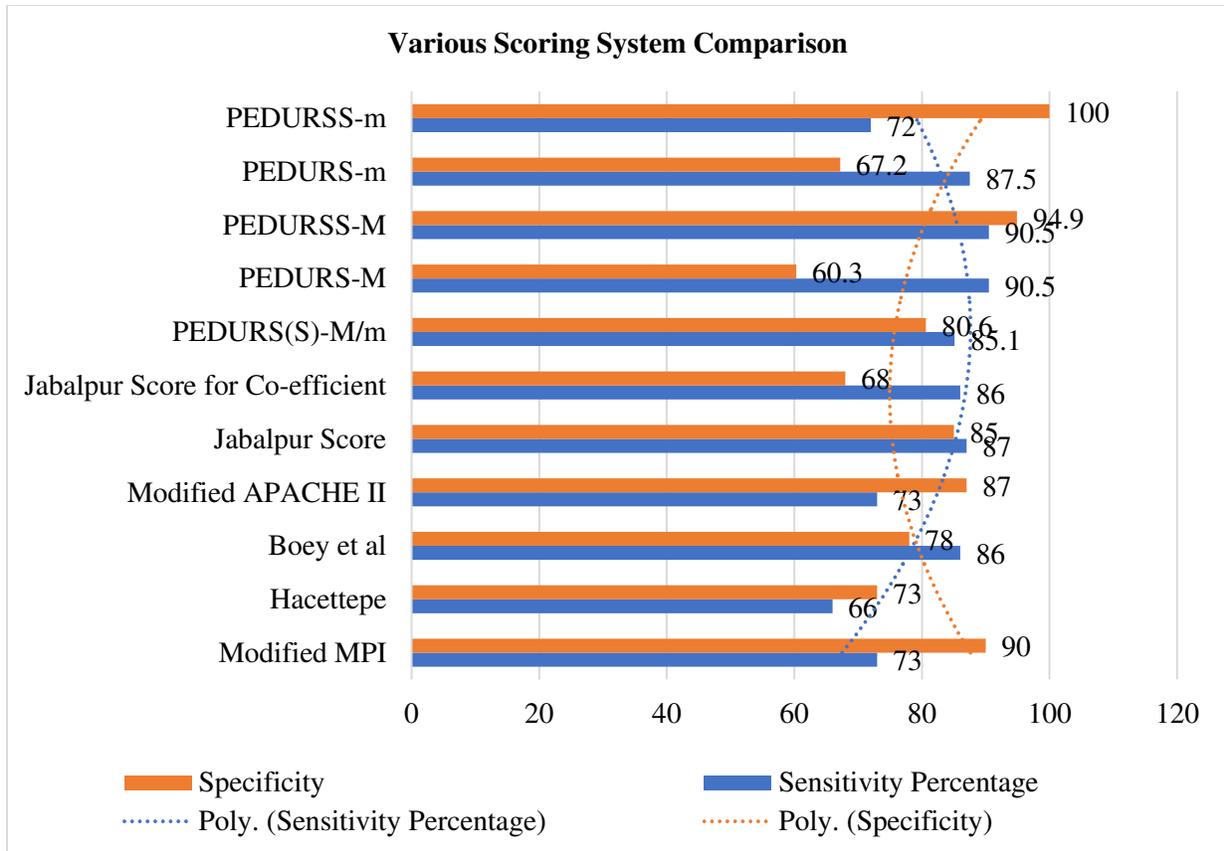
cases of morbidity (21.2%). Poor prognosis cases were observed with higher scores with significant P-value of (0.001). Similarly, grave prognosis cases were also observed with great scores with significant P-value as (0.001). An overall sensitivity and specificity was respectively 85.12% and 80.67%, which can be compared with the other systems of scoring. Table I and II respectively show detailed outcomes about thirty days prognosis scoring models and Various scoring system comparative analysis.

Table – I: Scoring System Models for Scoring 30 Days Prognosis

Parameters	PEDURS-M/ PEDURS-m (Intra-operatively)		PEDURS(S)M/ PEDURS(S)-m (Post-operatively)	
	Single – 0	Multiple – 2	Single – 0	Multiple – 2
Gut perforations number	Single – 0	Multiple – 2	Single – 0	Multiple – 2
Large perforation size	≤ 0.5cm – 0	> 0.5 – 2	≤ 0.5cm – 0	> 0.5 – 2
Peritoneal Fluid Amount	≤ 1000 ml – 0	< 1000 ml – 1	≤ 1000 ml – 0	< 1000 ml – 1
Simple Closure Versus Definitive Surgery	Simple Closure Surgery – 2	Definitive Surgery – 0	Simple Closure Surgery – 2	Definitive Surgery – 0
Complications Development	Yes – 2	No – 0	Yes – 2	No – 0
Post-operative systemic septicemia	-	-	Yes – 3	No – 0

Table – II: Comparison of Various Scoring Systems

Scoring System Percentage	Sensitivity Percentage	Specificity
Modified MPI	73	90
Hacettepe	66	73
Boey J et al	86	78
Modified APACHE II	73	87
Jabalpur Score	87	85
Jabalpur Score (Co-efficient)	86	68
PEDURS (S) – M/m	85.1	80.6
PEDURS – M	90.5	60.3
PEDURSS – M	90.5	94.9
PEDURS – m	87.5	67.2
PEDURSS – m	72	100



DISCUSSION:

Various predictors are helpful in the stratification of the risk in the duodenal perforation prognosis signifying the rapid therapeutic measures [9]. Our mortality rate was 21 cases (21.2%) in thirty days which can be compared with the outcomes of Mattingly SS and Thomsen RW (32.3%) [4, 17]. Male were observed gender wise positive predictor (P-value = 0.001), which is contrary with the outcomes as observed by Kim JM [6]. We did not take gender as an accounting variable. Mean age of the non-survivors and morbidity cases were respectively (44.38 ± 15.9) years and (46.96 ± 17.67) years, which is far less as reported by Kim JM and Wakayama T [6, 18].

Our research observed age as significant prognostic predictor (P-value > 0.05). Older age and higher mortality may be linked with the medical illnesses [11]. We did not include the medical illness cases because of this reason and age was also not a positive predictor. Summer/ spring seasonal presentations were observed as (51.5%); whereas, winter/ autumn were linked with worst prognosis (P-value = 0.001). Seasonal variation has been reflected in previous records [19, 20]. New scoring system did not use this proctor as a positive predictor as climate is different in different regions.

Numerous gut perforations had an association with mortality and morbidity (P-value = 0.005). Largest perforation size was also significantly associated with scoring system as (P-value = 0.01), which is comparable with the research of Chiarugi M and Nakano A et al. [21, 22]. Greater amount and extent of peritoneal fluid and contamination were significant predictor as observed in our research observed in 81% cases (P-value < 0.0005, mortality) and 75% cases (P-value = 0.02, morbidity) supported by various authors [11, 23].

Complications progression and systemic septicemia were also positive predictors of morbidity and mortality (P-value < 0.0005) which can be compared with the outcomes of Chiarugi M and Boey J et al. [22]. In fact, Boey J score can poorly predict mortality through sepsis, ASA and APACHE – II score in the presence of perforated peptic ulcers. This made us to devise another scoring system (PEDURS(S) – M/m) and also validated through ROC analysis (Table – II) which is simple and easy.

CONCLUSION:

New scoring system (PEDURS(S)-M/m) is considered as a helpful and useful instrument for the prediction of thirty days prognosis for the patients of acid peptic disease and perforated duodenal ulcers. It

can be helpful for the stratification process about the both acid peptic disease and perforated duodenal ulcers. High risk cases can be treated promptly through this scoring system.

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