Original research article

To Study Validation and Assessment of PF Portsmouth Possum Scoring in Cases of Exploratory Laparotomy

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Abstract

Background: One of the earliest scoring systems for projecting surgical outcome was POSSUM. In general surgery, it was discovered that the P-POSSUM approach was more reliable for predicting death. Objectives - The chief objectives of present research are to examine the validity and assessment of the PF Portsmouth Possum Scoring in cases of exploratory laparotomy and to study the mortality rates using Portsmouth POSSUM scoring in patients undergoing laparotomy and to calculate observed/predicted ratio for mortality based on Portsmouth POSSUM.

Materials and Methods: An observational clinical trial that was to be done in general surgery and SICU wards at the Department of General Surgery, MGM Medical College and Hospital, Aurangabad was prospective and non-randomized. The patients on admission were evaluated as per Portsmouth - Possum Scoring. Operative outcomes had been taken note off, and a tailored surgical procedure would be performed. The patients were then assessed and the data will then be analyzed using the linear technique of analysis. After that, the observed to anticipated (O:P) ratio will be determined.

Result: Using a linear analytic equation, the observed and P-POSSUM predicted death rates were compared. The obtained observed to expected ratio (O: E) was 1.5 (p=0.429), which was not statistically significant. Conclusion - P-POSSUM score includes the identification of high risk patients who would benefit from expedited surgical treatments or improved resuscitation during the pre and intra-operative phases.

Keywords: POSSUM score, Portsmouth POSSUM score, Colorectal surgery, Exploratory laparotomy , Mortality

Introduction

In both industrialized and developing nations throughout the past few decades, patient outcomes have been utilized as a criterion of patient care quality. In order to compare results between surgeons, hospitals, regions, and specific instance, which may have an impact on the outcome of a surgical procedure, risk-adjusted studies are essential. Mortality and morbidity rates, however, have obvious limitations when evaluating the quality of care and may produce inaccurate results because they do not take into account the patient's age, general health, or physiologic state at the time of operation. Different scoring systems have been created to provide a more unbiased evaluation of care quality. One of the earliest grading systems for projecting surgical outcome was the Physiological and Operational Severity Score for the enumeration of Mortality and Morbidity (POSSUM).Since its creation in 1991 by Copeland et al., it has been used on a variety of surgical populations, including those undergoing orthopaedic treatment, vascular surgery (such as carotid endarterectomy, etc.), head and neck surgery, and GI/Colorectal surgery[1].

The system that is most well-known and frequently utilized is APACHE (acute physiology and chronic health evaluation). However, APACHE is less effective than POSSUM in the evaluation of surgical patients because of its complexity and exclusion of operative considerations. It has also been demonstrated that other rating systems are indirectly related to surgical results. For instance, ASA (American Society of Anesthesiologists) grade increases post-operative mortality, but despite being easier to use than APACHE, it once again excludes operating factors other than emergent figures. POSSUM analyses physiological aspects of the patient and the surgical technique to assess the outcomes of surgical procedures, their effects, and the ratio between expected and observed morbidity and mortality in each death risk group of the population that received this type of care.

The signs and clinical symptoms of each patient, the outcomes of biochemical tests, the findings of hematologic investigations, and the outcomes of electrocardiographic examinations are the 12 variables that constitute the physiological portion of the score. Using exponential scores of 1, 2, 4, and 8, the aforementioned variables are grouped into 4 levels. A score of 1 was given if the variable wasn't analysed for any reason. Several variables' averages were utilised to evaluate them (clinical signs and symptoms and changes found in the chest radiography). The lowest possible score is 12, and the greatest possible score is 88. The six factors that make up the part of surgery gravity are the size of the operation, previous surgeries within 30 days, blood loss, peritoneal contamination, the presence of malignant aspects, and the type of surgery. Each of these variables is divided into four levels with scores of 1, 2, 4, and 8.

Since the introduction of the original POSSUM system, a number of modifications have been proposed for the unique needs of certain surgical subspecialties. Concern has also been raised over POSSUM score’s applicability in healthcare domains other than the one for which they were first intended. As a result, changes to the initial POSSUM score were made. By employing the original POSSUM score, the Portsmouth POSSUM (P-POSSUM) method was created to address the issue of overestimating death in patients at low risk. In general surgery, it was discovered that the P-POSSUM approach was more reliable for predicting death.

Aims and Objectives

The chief objectives of present research are to examine the validity and assessment of the PF Portsmouth Possum Scoring in cases of exploratory laparotomy and also to study the mortality rates using Portsmouth POSSUM scoring in patients undergoing laparotomy between 18-90 years of age group and to calculate observed/predicted ratio for mortality based on Portsmouth POSSUM in General Surgical and Surgery ICU wards.

Material and Methods

The current study was carried out at the Department of General Surgery MGM Medical College and Hospital, Aurangabad. An observational clinical trial that was to be done in general surgery and SICU wards was prospective and non-randomized. In a predesigned proforma, the demographic profile's in-depth history and assessment were documented.

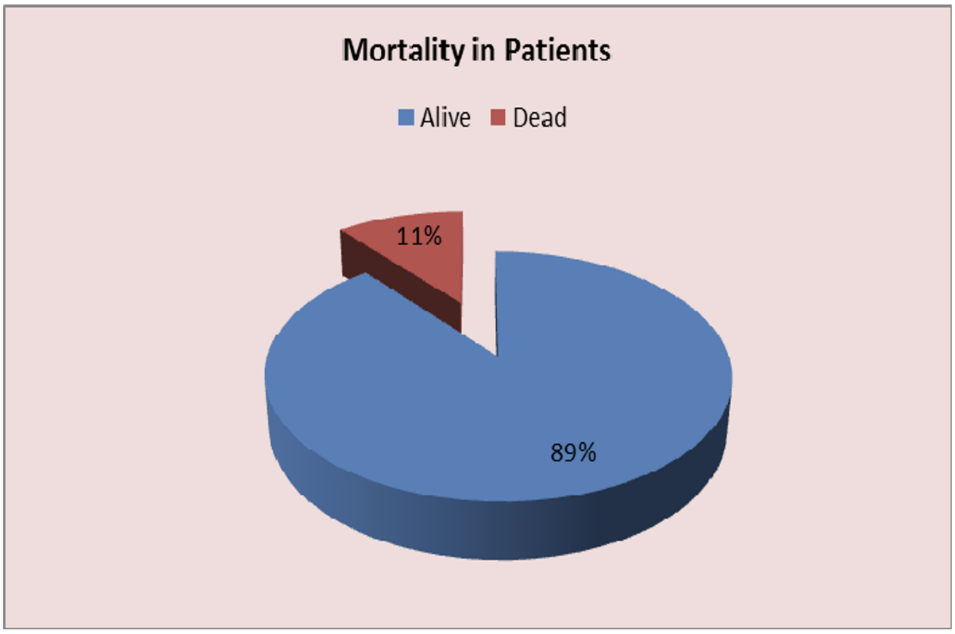
The patients on admission, were evaluated as per Portsmouth - Possum Scoring, under the physiological parameters, namely, age, cardiac status, respiratory status, ECG, systolic blood pressure, pulse rate, haemoglobin, WBC count, serum urea, serum sodium, serum potassium, GCS (Glasgow Coma Scale). Intravenous antibiotics were given after blood was sampled. According to urine output, all patients underwent intravenous correction of fluid and electrolyte imbalance. The patient had a laparotomy as soon as possible after being resuscitated. Operative outcomes had been taken note off, and a tailored surgical procedure would be performed. The patients were then assessed based on the following surgical parameters: surgical method, surgical approach, surgical blood loss, peritoneal soiling, and surgical severity. One pad equals 100 milliliters of blood, so the total volume of blood lost during surgery will be calculated based on the number of soaked pads or the amount of blood in the suction drainage system.
The data will then be analyzed using the linear technique of analysis after 12 physiologic and 6 operative variables have been assessed using a four-grade scoring system.
Using the Portsmouth POSSUM calculator, which may be found online at (*http://www.riskprediction.org.uk/pp-index.php*), the calculations were completed. After that, the observed to anticipated (O:P) ratio will be determined. P value < 0.05 will be taken as significant.

Criteria For Selection :
Patients aged between 18 - 90 years.
Patients undergoing laparotomy .

Criteria For Exclusion :
Patients below 18 years and above 90 years of age.
Patients having perforation peritonitis, intestinal obstruction but conservatively managed (eg. by doing continuos peritoneal lavage, CPL)

Observations and Results
This Study was conducted in the Department of Surgery, M.G.M. Medical College and Hospital, Aurangabad (MS), India and the duration of the study was from October 2014 to September 2016, where 165 patients underwent Exploratory Laparotomy. The following observations were noted -

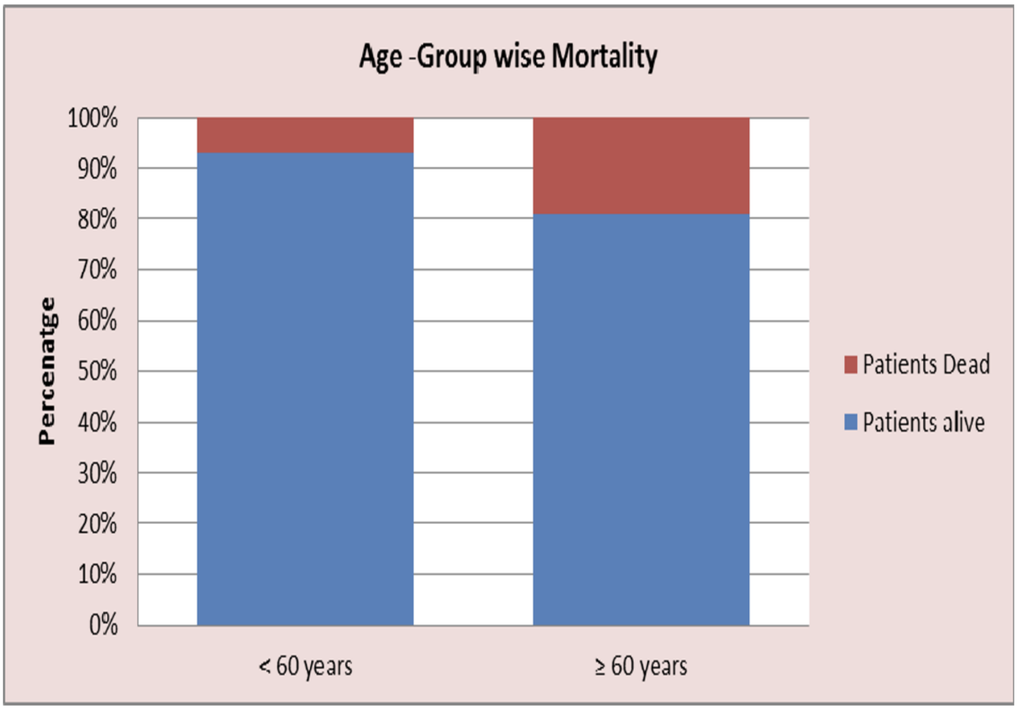
1. Mortality in patients
18 patients (10.91%) out of 165 patients died, leaving 147 patients (89.09%) living as shown in Graph 1.



Graph-1: Mortality in patients

2. Age specific mortality in different age groups –

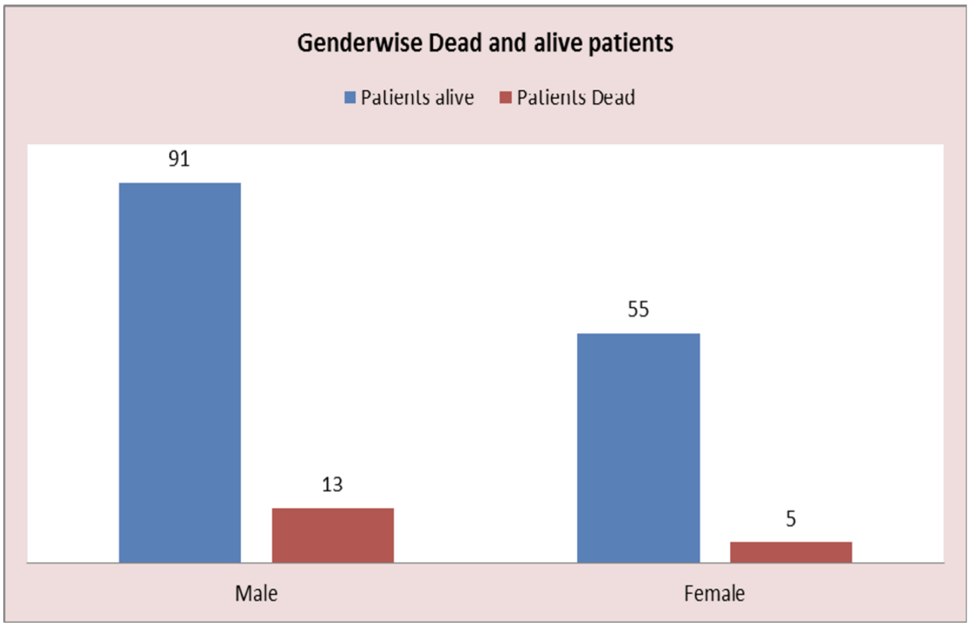
Among the 165 patients, 113 (68.48%) were under 60 years of age and 52 (31.52%) were older than 60. Patients under 60 had a mortality rate of 08 [7.08%], whereas those above 60 had a mortality rate of 10 [19.23%] as shown in Graph 2.



Graph-2: Age specific mortality in different age groups

3. Gender wise specific mortality –

Out of the 165 total patients, 104 (104%) were men; 91 of them survived, and 13 died, representing 12.5%. Out of 61 female patients, 56 survived and 5 passed away, representing 8.2% as shown in Graph 3.



Graph-3: Gender wise specific mortality.

4. Cardiovascular status of the patients, with mortality in different groups -
Patients with established hypertension had an intermediate mortality of 61.90%, patients with raised jugular venous pressure, cardiomegaly had a highest mortality of 100%, and patients with no cardiac problems had the lowest mortality rate of 1.43%. as shown in Table 1.

Table 1:Cardiovascular status of the patients, with mortality in different groups.

Cardiac Status	No failure	Diuretic, digoxin, antianginal orantihyper-tensive therapy	Peripheral edema, Warfarin therapy Borderline cardiomegaly	Raised jugular venous pressure cardiomegaly
No. of patients	140	21	3	1
Patients alive	138	8	1	0
Patients Dead	02	13	2	1
Percent dead	1.43%	61.90%	66.67%	100%

5. Respiratory status of the patients with mortality in different groups –
The mortality rate for patients with no dyspnea was 1.61%, that for patients with exertional dyspnea was 17.4%, that for patients with limitation dyspnea was 70.0%, and that for patients with resting dyspnea or consolidation on X-ray was 62.5% as shown in Table 2.

Table 2: Respiratory status of the patients with mortality in different groups

Respiratory	No. of patients	Patients alive	Patients Dead	Percent dead
No dyspnoea	124	118	02	1.61%
Dyspnoea on exertion, mild COAD	23	19	4	17.4%
Limitation dyspnoea moderate COAD	10	02	7	70.0%
Dyspnoea at rest pulmonary fibrosis / consolidation onX-ray	8	03	5	62.5%

6. ECG findings of the patients with mortality in different groups –

Lowest mortality was 6.08% for patients with normal ECGs, intermediate mortality was 75.0% for those with AF, and maximum mortality was 61.53% for those with Q wave or ST/T changes in their ECGs as shown in Table 3.

Table 3: ECG findings of the patients with mortality in different groups

ECG	ECG normal	ECG = AF, rate 60-90	ECG =any other abnormal rhythm, >4/min. ectopics, Q waves, ST/T changes
No. of patients	148	4	13
Patients alive	139	1	5
Patients dead	09	3	8
Percent dead	6.08%	75.0%	61.53%

7. Systolic BP (in mm of Hg) of the patients on admission with mortality in different groups –

The lowest death rate was 3.9% for patients with systolic blood pressure in the normal range (110-130mm Hg). Mortality was 5.47% for patients with systolic blood pressure in the 131–170 mm Hg or 100–109 mm Hg range. 70% of patients who had systolic blood pressure in the 90-99 mm Hg or >171 mm Hg range died. 80% of patients who had systolic blood pressure less than 89 mmHg died as shown in Table 4.

Table 4: Systolic BP (in mm of Hg) of the patients on admission with mortality in different groups

Systolic BP	110-130	131-170 or100-109	>171 or 90-99	<89
No. of patients	77	73	10	5
Patients alive	74	69	03	01
Patients dead	03	04	7	4
Percentage of patients dead	3.9%	5.47%	70.0%	80.0%

8.Pulse rate of patients (in beats per minute) at the time of admission with mortality in different groups –

In the current study, patients with pulse rates between 50 and 80 beats per minute (bpm) died at a rate of 11.11%, while those with pulse rates between 40 and 49 or 81 and 100 beats per minute (bpm) died at a rate of 5.26%. Mortality was 8.62% for patients with pulse rates between 101 and 120 beats per minute. Patients whose pulse rates were less than 40 or more than 120 beats per minute had the highest mortality rate, which was 66.67% as shown in Table 5.

Table 5:Pulse rate of patients (in beats per minute) at the time of admission with mortality in different groups.

Pulse Rate	No. of Patients	Patients alive	Patients dead	Percent of pts dead
50-80 bpm	63	56	7	11.11%
40-49 or 81-100 bpm	38	36	2	5.26%
101-120 bpm	58	53	5	8.62%
<40 or >120 bpm	06	02	4	66.67%

9. Hb distribution in the patients with mortality in different groups –

The lowest mortality rate was 3.70 % for patients with Hb between 13 and 16 g/dl, while the highest mortality rate was 8.33 % for patients with Hb between 11.5 and 12.9 g/dl or 16.1 to 17 g/dl. Patients with Hb levels between 10 and 11.4 or 17.1 and 18 g/dl had a death rate of 13.46%, while those with Hb levels below 10 or above 18 g/dl had a mortality rate of 19.23% as shown in Table 6.

Table 6: Hb distribution in the patients with mortality in different groups

Haemoglobin	No. of patients	Patients alive	Patients dead	Percent of patients dead
13-16g/dl	27	26	01	3.70%
11.5-12.9 or 16.1-17g/dl	60	55	05	8.33%
10-11.4 or 17.1-18g/dl	52	45	07	13.46%
<10 or >18g/dl	26	21	05	19.23%

10. WBC distribution among the patients with mortality in different groups –

Patients with a WBC count between 4 and 10/mm^3 had a 7.6% death rate. Mortality was 9.45% in patients with a WBC count of 10.1–20 or 3.1-4/mm^3. Another group had mortality of 24.0% where WBC counts are either >20/mm^3 or <3/mm^3 as shown in Table 7.

Table 7: WBC distribution among the patients with mortality in different groups

WBC	No. of patients	Patients alive	Patients dead	Percent dead
4 to 10/mm3	66	61	05	7.6%
10.1-20 or 3.1-4/mm3	74	67	07	9.45%
>20 or <3/mm3	25	19	06	24%

11. Serum urea in the patients with mortality in different groups –

Patients with urea below 136 mg/dl had the lowest mortality rate, which was 6%. Patients with urea between 136 and 180 mg/dl had the mortality rate of 10.34%. Patients with urea between 180 and 270 mg/dl had the mortality rate, which was 75.0%. Patients with urea >270 mg/dl had the mortality rate of 100% as shown in Table 8.

Table 8: Serum urea in the patients with mortality in different groups.

Sr. Urea	<136mg/dl	136-180mg/dl	180-270mg/dl	>270 mg/dl
No. of patients	100	58	04	03
Patients alive	94	52	01	00
Patients dead	06	06	03	03
Percent dead	6.00%	10.34%	75.0%	100%

12. Sr.Sodium distribution in the patients with mortality in different groups –

Patients with serum sodium levels above 135 mmol/l had a death rate of 5.32%, whereas those with serum sodium levels in the 131–135 mmol/l range had a mortality rate of 7.69%. Mortality in the group with serum sodium levels between 126 and 130 mmol/l was 41.67%. Mortality was higher in the group with serum sodium concentrations below 126 mmol/l (57.1%) as shown in Table 9.

Table 9: Sr.Sodium distribution in the patients with mortality in different groups

Sodium	>135 mmol/l	131-135mmol/l	126-130mmol/l	<126 mmol/l
No. of patients	94	52	12	07
Patients alive	89	48	07	03
Patients dead	05	04	05	04
Percent dead	5.32%	7.69%	41.67%	57.1%

13. Distribution of Serum Potassium among the patients with mortality in different groups –

Patients with blood potassium levels between 3.5 and 5 mmol/l had a mortality rate of no more than 3.89%, while patients with potassium levels in the 3.2 to 3.4 or 5.1 to 5.3 mmol/l range had an intermediate mortality rate of 6.77%. The individuals with serum potassium levels between 2.9 and 3.1 mmol/l or 5.4-5.9 mmol/l had the highest mortality rate (42.86%). Patients who had serum potassium levels between 2.9 and 5.9 mmol/l had a 33.33% death rate as shown in Table 10.

Table 10: Distribution of Serum Potassium among the patients with mortality in different groups

Potassium	3.5-5 mmol/l	3.2-3.4 mmol/l or 5.1-5.3 mmol/l	2.9-3.1mmol/l or 5.4- 5.9mmol/l	<2.9 or> 5.9mmol/l
No.of patients	77	59	14	15
Patients alive	74	55	08	10
Patients dead	03	04	06	05
Percent dead	3.89%	6.77%	42.86%	33.33%

14. Showing the GCS (Glasgow Coma Scale) of the patients with mortality in different groups –

9.81% of patients who had GCS 15 died. The mortality rate for patients with GCS between 12 and 14 was 100%, while none of the patients had GCS between 9 and 11 and less than 9 as shown in Table 11.

Table 11: Showing the GCS (Glasgow Coma Scale) of the patients with mortality in different groups

GCS	15	12 to 14	9 to 11	<9
No. of patients	163	02	00	00
Patients alive	147	00	00	00
Patients dead	16	02	00	00
Percent dead	9.81%	100	00	00

15. Operative severity of the patients with mortality in different groups –

According to P-Possum Scoring, Exploratory Laparotomies were performed on the majority of patients and were classified as major operations. 10.97% of patients passed away after surgery. Only one patient underwent minor operation as shown in Table 12.

Table 12: Operative severity of the patients with mortality in different groups

Operation Type	Minor operation	Moderate operation	Major operation	Complex major
No. of patients	01	00	164	00
Patients alive	01	00	146	00
Patients dead	00	00	18	00
Percent dead	00	00	10.97%	00

16. Number of operative procedures patient has undergone with mortality in different groups –

Out of a total of 165 patients, 85 had just one procedure, 77 had two, and 3 had more than two. Among these patients, 11, 06, and 01 died respectively as shown in Table 13.

Table 13: Number of operative procedures patient has undergone with mortality in different groups

No. Of Procedures	One	Two	More than two
No. of patients	85	77	03
Patients alive	74	71	02
Patients dead	11	06	01
Percent dead	12.94%	7.79%	33.33%

17. Shows the amount of blood loss in millilitres, intra-operatively, with mortality in different groups –

Mortality was 9.43% in patients who had surgical blood losses under 100 ml. 13.56% of patients who underwent surgery and lost between 101 and 500 ml of blood died. No patient lost more than 500 ml of blood during surgery as shown in Table 14.

Table 14: Shows the amount of blood loss in millilitres, intra-operatively, with mortality in different groups

Operative Blood Loss (in ml)	<100mls	101-500mls	>500mls
No. of patients	106	59	00
Patients alive	96	51	00`
Patients dead	10	08	00
Percent dead	9.43%	13.56%	00

18. The peritoneal soiling during laparotomy with mortality in different groups –
Mortality was 8.83% in the individuals who had mild soiling. 100% of patients who experienced peritoneal soiling with free bowel content died. Among the patients without any soiling 8.77% mortality was seen as shown in Table 15.

Table 15: The peritoneal soiling during laparotomy with mortality in different groups

Peritoneal Soiling	No soiling	Minor soiling	Local pus	Free bowel content pus or blood
No. of patients	57	106	01	01
Patients alive	52	94	00	00
Patients dead	5	12	01	01
Percent dead	8.77%	8.83%	00	100%

19. Malignancy status of the patients with mortality in different groups –
According to P-POSSUM score, there were four categories, which were, "no malignancy, primary malignancy only, malignancy with nodal metastasis and malignancy with distant metastasis. Mortality was 8.05% in the individuals who had no malignancy while Mortality was 100% in the individuals who had malignancy with distant metastasis as shown in Table 16.

Table 16: Malignancy status of the patients with mortality in different groups

Malignancy	Not malignant	Primary malignancy only	Malignancy+ nodal mets	Malignancy+ distant mets
No of patients	149	12	03	01
Patients alive	137	09	01	00
Patients dead	12	03	02	01
Percent dead	8.05	25.0%	66.7%	100%

20. Mode of surgery with mortality in different groups –
Patients who underwent the procedure as an emergency within 24 hours had a mortality rate of 11.36%, while patients who got the procedure on an elective basis had a mortality rate of 3.33% as shown in Table 17.

Table 17: Mode of surgery with mortality in different groups.

Mode Of Surgery	Elective	Urgent/Emergency	(Emergency within 2 hrs)
No. of patients	30	132	03
Patients alive	29	117	01
Patients dead	01	15	02
Percent dead	3.33%	11.36%	25.0%

21. Comparison of Observed and Predicted Mortality Rate –

It was done using linear analysis equation. An observed to expected ratio (O: E) of 1.5 was obtained.

In the expected mortality range of 0-20 there were 122 patients, the expected number of deaths were 1, observed deaths were 1, the O:E ratio was 1.0.

In the expected mortality range of 20-40 there were 22 patients, the expected number of deaths were 1, observed deaths were 1, the O:E ratio was 1.0.

In the expected mortality range of 40-60 there was 12 patient, the expected number of deaths was 4, observed deaths were 7, the O:E ratio was 1.75.

In the expected mortality range of 60-80 there were 08 patients, the expected number of deaths were 5, observed deaths were 8, the O:E ratio was 1.6.

In the expected mortality range of 80-100 there was 1 patient, the expected number of death was1, and 1 death occurred, the O:E ratio was 1.0.

Using a linear analytic equation, the observed and P-POSSUM predicted death rates were compared. The obtained observed to expected ratio (O: E) was 1.5 (p=0.429), which was not statistically significant. The P- POSSUM score used to calculate expected deaths understated mortality in each group. This underestimation of mortality was irrespective of whether the expected mortality was high or low.

Discussion

By comparing the observed mortality rate with the expected mortality rate in 165 major general operations involving exploratory laparotomies, we evaluated the validity of P-POSSUM. Of these 147 patients had successful outcome and 18 patients died in the postoperative period, the crude mortality rate was 18 %, 10 patients i.e.10% died by applying P- POSSUM score. 18 (10.09%) of the 165 patients died, leaving 147 (90.91%) of them living.

The majority of the people we encountered at MGM belonged to the lower and middle classes. Postoperative results therefore depend on numerous factors such as presentation at hospitals after starting of symptoms and affordability for medications and continuing hospitalisation.

ADVANTAGES OF P POSSUM –

P POSSUM identifies patients who need to be treated more aggressively and closely monitored in the ICU or wards by forecasting preoperative mortality and morbidity.

For the purpose of predicting mortality following vascular surgery in 312 consecutive patients, Wijesinghe et.al evaluated POSSUM with Portsmouth POSSUM (P-POSSUM). Statistics for the first 30 days following surgery were gathered, and 41 deaths were found. For the analysis of POSSUM and P-POSSUM, respectively, linear and exponential approaches were used[2].

In the context of routine surgical care, the POSSUM scoring system necessitates the collection of simple physiological and operative values. The P-POSSUM equation makes the linear comparison analysis simple to use, which is important in developing nations with little resources. The P POSSUM SCORING system can be used in the Indian context. It enables comparative audit to keep an eye on our level of treatment and produce the best outcomes.

Sagar et.al examined the practicability of using the P-POSSUM scoring system for comparative audit and forecasting the rate of adverse outcomes following colorectal resection. The P-POSSUM scoring method was used to analyse 248 patients who underwent colorectal resection in two distinct facilities. The observed to expected ratio was substantially identical in both units, with a P-POSSUM projected mortality rate of 5.2% in unit A (observed 6%) and 9.8% in unit B (observed 9%). They came to a conclusion by validating the P-POSSUM scoring system in patients having colorectal surgery and by demonstrating its effectiveness in a comparative audit[3].

Murray G. D argued that utilising crude death rates for comparison was a bad idea because statistical modelling is needed to forecast the quality of care[4].

The P-POSSUM scoring system's suitability for estimating mortality rates in patients having oesophageal resection was put to the test by Zafirellis K D. Retrospective analysis was performed on 204 patients in total, and the results were analysed using the linear approach. A poor evaluation of death rate prediction may be seen in the observed and expected mortality rates, which were 12.7% and 19.1%, respectively[5]. To better anticipate death rates in their study group, they came to the conclusion that the P-POSSUM scoring system needed to be calibrated.

In a retrospective research, Neary B used the physiological component of POSSUM to forecast the likelihood of a negative result following intra arterial thrombolysis for acute limb ischemia[6]. It was discovered that the physiological element of POSSUM successfully predicted the likelihood of a negative outcome. They recommended using Possum even in non-operative situations.

Using the hospital-based investigational protocols, Bann S. D. and Sarin S evaluated the applicability of POSSUM and rejected patients with insufficient data. They discovered a notable lack of fit to the reported fatality rate and made recommendations for clarifications on the applicability of POSSUM and P-POSSUM in patients undergoing general surgery[7].

Organ N assessed P-POSSUM in 221 patients who had had surgery as part of a retrospective research to test its efficacy in the Australian context[8].

In a prospective trial including 1,017 patients undergoing colorectal surgery, Tekkis P assessed POSSUM and P-POSSUM. The observed death rate was 7.5 percent, although POSSUM and P-POSSUM projected rates of 8 and 7 percent, respectively. They discovered that emergency situations and elderly patients had underpredicted outcomes (p 0.05), while youthful patients had overpredicted outcomes (p 0.001). In these patient groups undergoing colorectal surgery, they have recommended recalibration[9].

In order to predict mortality among patients undergoing hepatectomy for hepatocellular carcinoma in China, Lam C M were able to validate the P-POSSUM scoring system (O: E ratio = 1.4 x2 test = 7.6, 3 d.f., p = 0.055)[10].

To determine its application in their scenario of a developing country, Yii M K and Ng K J tested POSSUM and P-POSSUM scoring systems for the prediction of death rates among patients undergoing general surgery in a tertiary referral hospital in Malaysia. There was a significant difference (p 0.01) between the observed rates for the four separate risk groupings, which were 6.1%, and the 10.5% projected by the POSSUM algorithm. 4.8% was the projected mortality using P-POSSUM, which approximated the observed rate well. In order to allow for reliable data comparison, they recommended additional studies to validate P-POSSUM, particularly in other developing nations. They concluded by validating P-POSSUM as an effective tool for forecasting the bad outcome rate in the Malaysian context[11].

The observed to expected (O:E) mortality ratio for POSSUM and P-POSSUM showed that there were significantly fewer deaths observed than anticipated across all risk deciles. Our findings point to a 30–60% decrease in O:E mortality. We propose that either it is unsuitable to use POSSUM models to predict mortality in patients admitted to level 1 care wards or that POSSUM needs to be recalibrated in order to be beneficial in a level 1 care ward setting.

We discovered in our investigation that the P-POSSUM score significantly underpredicted the projected mortality scores. In our investigation, it was discovered that important predictors of death included cardiac status, respiratory status, ECG results, Systolic BP, haemoglobin, urea, Serum Na, Serum K, and peritoneal soiling. The mortality rate could therefore be reduced by proper and quick adjustment of these causes.

Conclusion:

Prediction models do confront a number of difficulties. A few desirable traits of risk-adjusted mortality predictors include the absence of lead-time bias and the inability to be influenced by a patient's hospitalisation status. The use of the current models has grown despite their flaws in timely decision-making and hospital cost reduction. The severity score scale, index, or model that is used must also appropriately reflect the circumstance, setting, or application; otherwise, improper use of these systems could lead to avoidable time loss, increased costs, wrong cost extrapolations, poor management, and even fatalities. P-POSSUM score differs in that it includes the identification of high risk patients who would benefit from expedited surgical treatments or improved resuscitation during the pre- and intraoperative phases.

Due to differences in nutritional status, disease-fighting mechanisms, and hospital service systems, which can affect the results of scores developed in one population and applied to others, the calibration of the model is advised for populations from different countries, calling into question the use of a single mode for all situations. To enable better mortality rate prediction, we propose that P-POSSUM scoring needs to be calibrated.

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