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Original Research Article

Evaluation of mortality and morbidity in patients with secondary peritonitis using predictive score of mortality in perforated peptic ulcer

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ABSTRACT

Background: Gastrointestinal tract perforation is one of the common surgical emergency all over the world. Menekse et al devised POMPP score (predictive score of mortality in perforated peptic ulcer) to predict the morbidity and mortality in peptic ulcer perforation. The objective of this study was to assess the validity of POMPP score in peptic ulcer perforation and to assess its usefulness in gastrointestinal perforation due to causes other than the peptic ulcer.
Methods: Fifty consecutive cases, who had undergone exploratory laparotomy for gastrointestinal perforation peritonitis, were included in the study. "These patients were assessed at the time of admission on the basis of Age >65 years, BUN >45mg/dl (Blood Urea Nitrogen) and Albumin <1.5g/L and a score of 1 point each had been given". The total score was compared with the outcome of the disease in relation with mortality.
Results: In our study, 42% of gastrointestinal perforation were due to peptic ulcer, 22 % due to small bowel perforations (18% Ileal and 4 % Jejunal), 14 % due to trauma and 22 % due to miscellaneous causes. Morbidity is common after gastrointestinal perforation and it ranges from 17-63% whereas mortality ranges from 6-14%.
Conclusions: POMPP score is easy and valid scoring system for peptic ulcer perforation. Early detection of high risk peptic perforation cases, allow other supportive treatment modality apart from surgery which can decrease the mortality. However, this score is not valid in perforation due to causes other than peptic ulcer.

Keywords: Gastrointestinal tract perforation, POMPP score, Peptic ulcer perforation scoring

INTRODUCTION

Gastrointestinal tract perforation is one of the common surgical emergency all over the world. The spectrum of aetiology of gastrointestinal perforation in India is different from the western world.[1] It is one of the common cause of morbidity and mortality in adults. Duodenal ulcer perforations are 2-3 times more common than gastric ulcer perforation. In one third of patients, gastric ulcer perforation is due to gastric carcinoma. There is advancement in the surgical technique, intensive care support and antimicrobial therapy but still surgery for gastrointestinal perforation is difficult and complex.

Menekse et al, devised POMPP score (predictive score of mortality in perforated peptic ulcer) to predict the morbidity and mortality in peptic ulcer perforation.[2]

This study is aimed to assess the validity of previously derived POMPP score in peptic ulcer perforation by Menekse et al and also to assess its usefulness in other gastrointestinal perforation.

METHODS

This is a prospective study conducted at Himalayan Institute of Medical Sciences, Dehradun, India from 29th November 2016 to 1st June 2017. The study protocol was

approved by Himalayan Institute of Medical Sciences, Dehradun, India local ethical committee. Informed consent form was obtained from all participants included in the study. Fifty consecutive cases, who had undergone exploratory laparotomy for gastrointestinal perforation peritonitis, were included in the study. "These patients were assessed at the time of admission on the basis of Age >65 years, BUN >45mg/dl (Blood Urea Nitrogen) and Albumin <1.5g/L and a score of 1 point each had been given".[2] Total score was between 0-3 and maximum score were 3. The total score was compared with the outcome of the disease in relation with mortality. The death that occurred within 30 days of continued hospital admission after surgical treatment or death at the same admission had been included as hospital mortality. Perforation due to malignancy were excluded from the study.

RESULTS

50 consecutive cases of gastrointestinal perforation were enrolled for the study. All these patients were assessed on the basis of age, preoperative BUN and serum albumin. Table 1 is showing different types of perforation which were enrolled in the study. There were 44 males and 6 female cases. POMPP scoring was done in all the patients. Morbidity, like local complication (surgical site infection, wound dehiscence, entero-cutaneous fistula and pelvic abscess), and systemic complication (like respiratory, cardiac and renal complications) and mortality assessed as per the Table 2-5.

Table 1: Different sites of perforation (n=50).

Site of perforation	No. of cases	M	F
Peptic ulcer perforation (duodenal)	11	10	1
Peptic ulcer perforation (gastric)	10	10	0
Appendicular perforation	03	3	0
Ileal perforation	09	7	2
Jejunal perforation	02	2	0
Caecal, colonic perforation and rectal	05	4	1
Gall bladder	3	2	1
Trauma (blunt/ penetrating)	7	6	1

There were 21 cases of peptic ulcer perforation (42%) as shown in Table 2. Graham's omental patch repair was done in all the cases. Out of these 21, 9 cases had zero score. There were no morbidity and mortality occurred in these patients.

Table 2: Peptic ulcer perforation (duodenal +gastric) n= 21.

		Local complication				Respiratory		Cardiac		Renal		
Score	N	SSI	WD	Others	ECF	URTI	ARDS	AF	BRAD	ARF	UTI	Mortality
0	9	-	-	-	-	-	-	-	-	-	-	-
1	9	3	2	-	-	1	-	-	-	-	1	-
2	2	1	-	-	1	-	1	-	-	-	-	-
3	1	-	-	-	-	-	1	-	-	-	-	1

N- Number, SSI- Surgical Site Infection, WD- Wound Dehiscence, ECF-Entero Cutaneous Fistula, RESP- Respiratory, URTI-Upper Respiratory Tract Infection, ARDS- Acute Respiratory Distress Syndrome, AF-Atrial Fibrillation, Brad-Bradycardia, ARF- Acute Renal Failure, UTI-Urinary Tract Infection, PA-Pelvic Abscess.

Table 3: Jejunal and Ileal perforation (n=11).

		Local complication				Respiratory		Cardiac		Renal		
Score	N	SSI	WD	Others	ECF	URTI	ARDS	AF	BRAD	ARF	UTI	Mortality
0	5	2	1	-	-	-	-	-	-	-	-	1
1	6	2	2	-	-	-	-	1	1	-	-	3
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-

Score 1 was found in 9 cases. Among these, 3 developed SSI, 2 had wound dehiscence and 1 developed respiratory and renal complication. There were two cases of score 2. One of them developed enter cutaneous fistula enter cutaneous fistula. No mortality found in score 1 and 2. Some cases had multiple local and systemic complications. There was 1 mortality with score 3. (Table 2). This result validates the POMPP score in peptic ulcer perforation.

There were 11 cases of Jejunal and Ileal perforation (22% together). Two of the Ileal perforation were due to tuberculosis with stricture and 7 cases of Ileal perforation

was due to enteric fever. Jejunal perforation was due to nonspecific inflammation on histopathological examination (HPE). Segmental resection and end to end hand shewn anastomosis done in tuberculous Ileal perforation with stricture. Primary repair done in all other Ileal and Jejunal perforation. Local and systemic complication were found as shown in Table 3. There were 1 mortality in score 0 and 3 mortalities in score 1.

Table 4: Perforation due to trauma (Blunt/ penetrating) n=7.

		Local complication				Respiratory		Cardiac		Renal		
Score	**N**	**SSI**	**WD**	**Others**	**ECF**	**URTI**	**ARDS**	**AF**	**BRAD**	**ARF**	**UTI**	**Mortality**
0	7	3	1	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-		-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-

Table 5: Miscellaneous (Gall bladder, Appendicular, caecal, colon and rectal perforation) n = 11.

		Local complication				Respiratory		Cardiac		Renal		
Score	**N**	**SSI**	**WD**	**PA**	**ECF**	**URTI**	**ARDS**	**AF**	**BRAD**	**ARF**	**UTI**	**Mortality**
0	7	2	1	-	1	-	-	-	-	-	-	1
1	3	1	-	2	-	-	-	-		-	-	-
2	1	-	-	-	-	-	-	-	-	-	-	1
3	-	-	-	-	-	-	-	-	-	-	-	-

There were 7 cases of perforation due to trauma. All the cases were male and with zero score (Table 4). Among these, 3 cases developed SSI and one had wound dehiscence even in score 0.

There was no mortality found in trauma patient.

11 cases were kept in miscellaneous category (Table 5). It consists of gall bladder perforation, caecal, colonic and rectal perforation. Open cholecystectomy was done in all cases of gall bladder perforation. In appendicular perforation, open appendectomy was done through midline incision. Caecal perforation was associated with Appendicular perforation or appendicitis, and limited right hemicolectomy was done in all these cases. Colonic perforation was repaired primarily whereas diversion colostomy was done in rectal perforation along with primary repair. All cases of colonic and rectal perforation in our study was found to be due to non-specific inflammation on HPE. 7 cases in miscellaneous group had a score of zero, 3 with score 1 and 1 with score 2 as shown in Table 5. There were 1 mortality in score 0 and another 1 mortality in score 2.

DISCUSSION

Gastrointestinal perforation is frequently encountered surgical emergency in tropical countries like India than western country.[3] Traumatic injury to the stomach and duodenum is rare.[4] Morbidity is common after gastrointestinal perforation from 17-63% whereas mortality and it ranges from 6-14%.[5-9] Main etiologic factors for peptic ulcer perforation are use of non-steroidal anti-inflammatory drugs (NSAIDs), steroids, smoking, Helicobacter pylori and a diet high in salt.[3,7] All these factors affect the acid secretion in the gastric mucosa. In India, the small bowel is the next common site of spontaneous perforation after peptic ulcer perforation as shown in our study. Most small intestinal perforations occur in the distal ileum. This is due to prevalence of enteric fever and tuberculosis in this region and this was the main etiological factor in small intestinal perforation. "Hypoalbuminemia was one of the major factor associated with increased mortality.[10-12] Age over 65 years is an independent risk factor for mortality.[13,14] BUN level is regulated as a result of several conditions such as protein catabolism, steroid intake and gastrointestinal bleeding. Regardless of renal functions, it is also accepted as a marker of a severity of disease".[15]

In this study, 42% of gastrointestinal perforation were due to peptic ulcer, 22% due to small bowel perforations (18% Ileal and 4% Jejunal), 14% due to trauma and 22% due to miscellaneous causes.

In this study, POMPP score was found to be very practical and easy. But it was valid only in peptic ulcer perforation.

CONCLUSION

POMPP score is easy and valid scoring system for peptic ulcer perforation. Early detection of high risk peptic perforation cases, allow other supportive treatment

modality apart from surgery which can decrease the mortality. However, this score is not valid in perforation due to causes other than peptic ulcer. Although, there is limitation. It is short duration study and limited number of cases were enrolled. Further long-term study in larger population is required.

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REFERENCES

1. Dorairajan LN, Gupta S, Deo SVS, Chumber S, Sharma L. Peritonitis in India-A decades experience. Trop Gastroenterol. 1995;16(1):33-8.
2. Menekse E, Kocer B, Topcu R, Olmez A, Tez M, Kayaalp C. A practical scoring system to predict mortality in patients with perforated peptic ulcer. World J Emerg Surg. 2015;10:7.
3. Suanes C, Salvesan H, Espehang B. A multifactorial analysis of factors related to lethality after treatment of perforated gastrduodenal ulcer. Ann Surg. 1989;209:418-23.
4. Watts DD, Fakhry SM. Incidence of hollow viscus injury in blunt trauma: an analysis from 275, 557 trauma admissions from the East multi-institutional trial. J Trauma. 2003;54(2):289-94.
5. So JB, Yam A, Cheah WK, Kum CK, Goh PM. Risk factors related to operative mortality and morbidity in patients undergoing emergency gastrectomy. Br J Surg. 2000;87:1702-7.
6. Lunevicius R, Morkevicius M. Systematic review comparing laparoscopic and open repair for perforated peptic ulcer. Br J Surg. 2005;92:1195-207.
7. FY LE, Leung KL, Lai BS, Ng SS, Dexter S, Lau WY. Predicting mortality and morbidity of patients operated on for perforated peptic ulcers. Arch Surg. 2001;136:90-4.
8. Arici C, Mesci A, Dincer D, Dinckan A, Colak T. Analysis of risk factors predicting (affecting) mortality and morbidity of peptic ulcer perforations. Int Surg. 2001;92:147-54.
9. Kocer B, Surmeli S, Solak C, Unal B, Bozkurt B, Yildirim O, Dolapci M, Cengiz O. Factors affecting mortality and morbidity in patients with peptic ulcer perforation. J Gastroenterol Hepatol. 2001;22:565-70.
10. Chandrasinghe PC, Ediriweera DS, Kumarage SK, Deen KI. Pre-operative hypoalbuminaemia predicts poor overall survival in rectal cancer: a retrospective cohort analysis. BMC Clin Pathol. 2013;13:12.
11. Nisar PJ, Appau KA, Remzi FH, Kiran RP. Preoperative hypoalbuminemia is associated with adverse outcomes after ileoanal pouch surgery. Inflamm Bowel Dis. 2012;18:1034-41.
12. Koertzen M, Punjabi P, Lockwood G. Pre-operative serum albumin concentration as a predictor of mortality and morbidity following cardiac surgery. Perfusion. 2013;28:390-4.
13. Møller MH, Engebjerg MC, Adamsen S, Bendix J, Thomsen RW. The peptic ulcer perforation (PULP) score: a predictor of mortality following peptic ulcer perforation. A cohort study. Acta Anaesthesiol Scand. 2012;56:655-62.
14. Boey J, Wong J, Ong GB. A prospective study of operative risk factors in perforated duodenal ulcers. Ann Surg. 1982;195:265-9.
15. Uchino S, Bellomo R, Goldsmith D. The meaning of the blood urea nitrogen/creatinine ratio in acute kidney injury. Clin Kidney J. 2012;5:187-91.

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