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Preoperative Predictors of Mortality in Adult Patients with Small Bowel Perforation at Tertiary Care Hospital in Western Rajasthan

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Abstract

Background: The peritoneum is the largest serous membrane in the body. With a surface of $2m^2$ it is equivalent to that of the skin and it covers the visceral organs (visceral peritoneum) and lines the abdominal cavity (parietal peritoneum).

Methods: A prospective study of 60 patients of perforation peritonitis who underwent laprotomy was done at Sardar Patel Medical College and PBM hospital, Bikaner during the period of September 2016 to November 2017.

Result: Maximum mortality was seen in the age group of 56-65 years followed by 46-55 years of age group. All the patients that died were males. There was no death in age group less than 35 years of age. And mortality gradually increased with Age ,60% of the patients not surviving in the age group 56-65 years.

Conclusion - We conclude that the age of the patient and Sex are independent predictors of mortality in patients with perforation peritonitis.

Keywords: Perforation Peritonitis, Age, Sex.

Introduction

The peritoneum is the largest serous membrane in the body. With a surface of $2m^2$ it is equivalent to that of the skin and it covers the visceral organs (visceral peritoneum) and lines the abdominal cavity (parietal peritoneum) [1]. The peritoneum is in constant contact with peritoneal fluid which facilitates normal functioning of the gastro-intestinal tract and bladder.

In the female it plays an important role in the motility of the fallopian tubes and oocyte retrieval. The concept of a peritoneal cavity with smooth lubricated surfaces is primordial for normal peristalsis of a long, loop-wise arranged, gastrointestinal tract [2-4]. Injury of the peritoneum, whether of surgical, inflammatory or ischemic origin, causes a desquamation of injured mesothelial cells, leaving a denuded area and causing an inflammatory reaction, characterized by cellular infiltration, formation of serosanguinous exudates and a growth response by the mesothelial cells [5]. Peritonitis is an inflammatory response which occurs as a result of infectious, ischemic and perforating injuries of gastrointestinal tract (GIT) and genitourinary system. Peritonitis can be:

(A) Primary Peritonitis- when source of peritoneal infection is from outside the peritoneal cavity and infection is monomicrobial. It is not directly related to other intra-abdominal abnormalities [6]

(B) Secondary Peritonitis when source of infection is intra abdominal usually a perforated hollow viscous organ or

(C) Tertiary Peritonitis that develops following treatment of secondary peritonitis[6].

Materials and Methods

A prospective study of 60 patients of perforation peritonitis who underwent laprotomy was done at Sardar Patel Medical College and PBM hospital, Bikaner during the period of September 2016 to November 2017. The relevant information was collected from the hospital records.

Inclusion Criteria

All patients of 16 years and above of peritonitis due to perforation of small bowel were included in the study.

Exclusion criteria

All cases with either primary peritonitis or that due to anastomatic dehiscence were excluded. Perforation peritonitis due to large gut perforation and patients below 16 years of age were also excluded. Patients who refused for surgery and who left against medical advice (LAMA) were not included in the study.

All the patients who presented to surgery emergency with provisional diagnosis of perforation peritonitis were studied thoroughly after taking detailed consent. The investigator was personally involved in all the cases preoperatively, during the surgery and for the post operative care. Detailed history was taken about the onset of symptoms, duration of symptoms, treatment taken already, history of any chronic illness in form of diabetes, hypertension, pulmonary tuberculosis and history of addiction was taken.

Patients were thoroughly examined, vitals recorded, patients checked for the presence for pallor, icterus, cyanosis, clubbing, generalized lymphadenopathy, and edema feet. Abdominal examination was done in detailed manner and checked for the presence of guarding, rigidity, distension or any scar from previous surgery. Respiratory and cardiovascular system was also evaluated.

Routine investigation in form of haemoglobin, total leucocyte count, differential leucocyte count, blood sugar level, renal function test, serum electrolyte levels and urine complete examination was done.

Radiological investigation done were plain X-ray chest with both dome of diaphragm. X-ray abdomen and ultrasound abdomen were done wherever indicated.

After resuscitation with intravenous fluids patients were posted for emergency laprotomy. Intra operative site of perforation was noticed. And patient was managed according to etiology. Time delay between hospital admission and surgery was also recorded. In hospital mortality was taken as final outcome.

Observations

Table1: Age and sex distribution

Age groups (years)	Male		Female	
	No. of cases	%age	No. of cases	%age
16-25	14	23.33	4	6.67
26-35	11	18.33	2	3.33
36-45	8	13.33	0	0
46-55	13	21.67	1	1.67
56-65	5	8.33	0	0
66-75	1	1.67	0	0
>75	1	1.67	0	0
Total	53	88.33	7	11.67
Range	17-85		20-50	
Mean	40.53±15.92		29.57±9.81	

Fig 1: Distribution of patients according to age and sex.

Age distribution- The youngest patient in study group was a 17 year old boy and oldest was 85 year old male patient. Maximum patient in both the sexes were in the age group of 16-35 years. The mean age in male was 40.53±15.92 and in female patient was 29.57±9.81. Combined mean age was 39.25±15.67.

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Sex distribution- Out of 60 patients in our study 53 (88.33%) were males and 7 (11.67%) were females.

Table 2: Age wise distribution of mortality.

Age (years)	Total no. of patients	Number of patients expired	Percentage of patients expired
16-25	18	0	0%
26-35	13	0	0%
36-45	8	1	12.5%
46-55	14	2	14.2%
56-65	5	3	60%
66-75	1	1	100%
>75	1	0	0%
Total	60	7	11.67%

χ^2	Df	p-value	Significance
13.4	6	0.037	Significant

Fig 2: Age wise distribution of mortality.

Table 2 shows age wise distribution of mortality in this study. Maximum mortality was seen in the age group of 56-65 years followed by 46-55 years of age group. All the patients that died were males. There was no death in age group less than 35 years of age. And mortality gradually increased as can be seen from table, with 60% of the patients not surviving in the age group 56-65 years. p-value is significant (0.037)

Table 3: Gender wise distribution of mortality.

Age (years)	Total no. of patients	Number of patients expired	
		Males	Females
16-25	18	0	0
26-35	13	0	0
36-45	8	1	0
46-55	14	2	0
56-65	5	3	0
66-75	1	1	0
>75	1	0	0
Total	60	7	0

Fig 3: Gender wise distribution of mortality.

Out of 60 patients, 7 patients expired and all were males. There were 7 female patients in our study and all of them had favorable outcome

Discussion

This prospective study was undertaken to evaluate preoperative predictors of mortality in adult patients of small bowel perforation. The study was conducted on 60 patients who presented to surgery emergency of PBM hospital, Bikaner with features of perforation peritonitis. The patients were evaluated by taking thorough history with complete clinical examination. All the routine blood investigation were done followed by X-ray chest, X-ray abdomen and ultrasound abdomen wherever it was indicated. Final diagnosis was made on intra operative finding of perforation of small bowel i.e. duodenal, jejunal, and ileal perforations. In hospital mortality was taken as final outcome. The various results and observation are hereby discussed.

AGE

Small bowel perforation is seen in both young and old age group. The two most common cause of small bowel perforation are ileal and duodenal perforation. Ileal perforation is common in younger age group while duodenal perforations are usually seen in old age group. High incidence of ileal perforation in younger age group is because of typhoid illness being more common in this age group. Acid peptic disease being more common in older age group is responsible for duodenal perforation in them. Most of the studies on small bowel perforation have mean age around 35-40 years.

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Singh et al in their study on small bowel perforation had mean age was 40.04 years [7]. While in a study by Afridi et al the mean age was 40.5 years (ranges from 13–80 years) standard deviation was 15.6 [8]. Jhobta et al did a study on patients of perforation peritonitis and mean age was 36.8 years in their study[9].

The mean age in our study was 39.25 years, and standard deviation was 15.67, with the range being from 17-85 years. Maximum patients in both sexes were in the age group of 26-35 years. Mean age in our study is comparable with the mean age in the other similar studies. Ileal perforation was most common cause of perforation in our study which is a disease of younger age group while the next common cause was duodenal perforation. The result are similar to those of Udwadia et al [10], Bhansali et al [11]. It is clear from above study that peritonitis is primarily a disease of adult and middle age group.

Age as a Prognostic Factor

Age has been well recognized as an important risk factors for patient outcome, with the extremes of ages, especially old age having higher mortality in patients of perforation peritonitis. Sanjay G and Robin K reviewed in their study on perforation peritonitis and reported higher mortality in patients over the age of 50 years [10]

In their study Paryani et al [13]observed that age is an important predictor of outcome. They found high mortality rate in the age group of less than 20 years and more than 50 years. According to them extremes of ages handle stressful condition poorly leading to higher mortality in these age groups.

Barut et al [14]on their study of 62 patients with perforated peptic ulcer observed 3 deaths from total 36 patients with less than 60 years and 8 deaths of total 26 patients with age more than 60 years. The p-value in their study was 0.022 which was significant and hence they concluded that old age was significant factor in patient outcome in their study.

We also found higher mortality in older age group. Out of 60 patients in our study 7 patients died. Among them maximum mortality was seen in the age group 56-65 years followed by 46-55 years of age group. As the increase of life expectancy has been observed due to improved health care, the number of geriatric patients with acute abdominal disease requiring emergency surgical treatment has increased in recent decades. In our study mortality was higher in older age group. This is because in older age physiological reserves of the body is significantly reduced and hence they tolerate stressful events like infection poorly. Also there is increase presence of co-morbid conditions in old age which in itself is known risk factor of increased mortality. Old age is also known to have delayed recovery as compared to younger age group.

Gender

Perforation peritonitis is mainly seen in males. The heavy preponderance of males could be due to more use of intoxicants like alcohol and smoking, irregular meal, more outdoor life and eating spicy food. All of them contribute to small bowel pathologies. Also males are more prone to infection and trauma. Another reason could be poor accessibility of female patients to higher center dealing with surgical emergencies. Female health in developing countries is still a neglected aspect. Shreshta et al in their study of 260 patients of perforation had 85.5% males and 11.6% females[15]. Memon et al in their study also had male preponderance with 77% of their patient being male and 23% being females [16]. Similarly Jhobta and associates from Chandigarh did a study on cases of perforation peritonitis and found that majority of patients were males (84%)[9].

Present study is comparable to above studies hence it is evident that perforation peritonitis is a disease with male

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preponderance. There is no strong evidence of higher mortality in either of gender over one another. Different studies have found variable result in this regard. Mortality in perforation peritonitis does not seem to be affected by the sex of patient.

Testini et al in their study on perforated peptic ulcer did not find higher mortality in either of genders [17]. Ozalp et al in their studies on perforated peptic ulcer also found disease to be more common in male with 210 of total 342 patients being male and 132 being female. This was in agreement to all other studies done previously. They did not however find any significant difference of mortality between two genders[18].

Barut et al in their study on peptic ulcer perforation observed that the mortality rate of women was higher than male population. But this difference was not directly related to the gender of patient. The mean age, time between onset of symptoms to surgery and coexisting medical disease ratio were higher in female group and these were possibly the causes of high mortality in females[19].

All the deaths occurred in our study were in males. Out of 7 female patients in our study no death occurred. This is probably because of high number of male patients (88.34%) in our study. The other important reason was that the majority of our female patients were in younger age group. There were very few female patients who had associated co-morbidities. Lastly renal functions of all the females in our study were normal. All these factors lead to decrease in female mortality in our study.

Summary and Conclusion

We conclude that the age of the patient and Sex are independent predictors of mortality in patients with perforation peritonitis.

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