IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 17, Issue 4 Ver.1 April. (2018), PP 18-21
www.iosrjournals.org

A Clinical study on Perforation Peritonitis patients to assess its Morbidity & Mortality

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Abstract: *Peritonitis is defined as an inflammation of the serosal membrane that lines the abdominal cavity and the organs contained in it. Its a life threatening condition having significant morbidity and mortality. Diagnosis is based on clinical background, Plain X-ray abdomen, Ultrasound and CT scan with Local and systemic findings. Our prospective observational study was carried out on such patients admitted in Department of Surgery from 1st Dec 2015 to 31st of March 2017 to assess disease's morbidity & mortality. A total of 51 patients were in this study. Our study concluded that delay in presentation, hypotension at time of admission, hypoalbumenia, site of perforation and type of operative procedure performed are significant factors affecting the morbidity and mortality in case of perforation peritonitis Simple repair is the recommended procedure in most of the cases, but more definite resection and anastasmosis can be justified in patient with favourable outcome. In gross peritoneal contamination, stoma formation should be procedure of choice*

Date of Submission: 22-03-2018 Date of acceptance: 05-04-2018

I. Introduction

Peritonitis is defined as an inflammation of the serosal membrane that lines the abdominal cavity and the organs contained in it. Its a life threatening condition having significant morbidity and mortality.In western countries blunt injury to abdomen and gastrointestinal malignancies are the predominant cause. There is paucity of data from India regarding same. Diagnosis is based on clinical background. Plain X-ray abdomen (erect). Ultrasound and CT scan may diagnose up to 72% and 82% of perforation. Local findings include abdominal tenderness, guarding or rigidity, distension, diminished bowel sound. Systemic finding include fever, chills or rigor, tachycardia, sweating, tachypnea, dehydration etc. In strictly localized lesion with normal bowel, a simple closure of perforation is warranted. In more advanced cases bowel resection and primary anastomosis is recommended, whereas in seriously ill patients with widespread peritonitis the anastomosis is protected by diverting the fecal stream by making a controlled fistula. This study prospectively reviews a series of patients with perforation peritonitis, their clinical presentation, surgical procedures carried out and outcome with regard to morbidity and mortality.

II. Material and Methods

This prospective comparative study was carried out on patients of perforation peritonitis admitted in Department of Surgery, People's Hospital Bhopal**,** attached to People's College of Medical Sciences & Research Centre Bhopal from 1st Dec 2015 to 31st of March 2017. A total of 51 patients with diagnosis of perforation peritonitis were for in this study.

Study Design: Prospective observational study

Study Location: This was a tertiary care teaching hospital based study done in Department of Surgery, People's Hospital Bhopal**,** attached to People's College of Medical Sciences & Research Centre Bhopal Madhya Pradesh

Study Duration: 1st Dec 2015 to 31st of March 2017

Sample size: 51 patients

Inclusion criteria:

Patients with clinical features suggestive of hollow viscus perforation including traumatic perforations between the age of 12 to 65 yrs.

Exclusion criteria:

1. Patients with traumatic perforation associated with injury to solid organ.
2. Patients with traumatic perforation associated with vascular injury.
3.Patients with perforation peritonitis who were not operated.
4. Patients unwilling to give consent for the study.

Procedure methodology

After obtaining well informed written consent, all the patients with features suggestive of hollow viscus perforation with peritonitis were enrolled for the study. Detailed clinical history and physical examination was done and recorded in the pre-designed proforma. Routine investigations carried out including complete hemogram,and renal function

tests. Radiograph of abdomen in erect position and USG abdomen was done in all the patients as diagnostic investigations. All the patients were subjected to emergency exploratory laparotomy after optimal resuscitation. Operative findings and surgical procedure carried out were recorded. Post-operative phase with special reference to surgical site infection, wound dehiscence, pulmonary and renal complications, gastro-intestinal leaks, fistula formation, resumption of oral feed, severe sepsis/ MODS, length of hospital stay, and mortality were noted.
Follow Up-Condition of the patients at the time of discharge was noted. They were followed up in Surgery OPD after 1 week and 4 weeks. A note was made about the condition of surgical scar/wound, and any other subsequent complications during this period.

Statistical analysis
The statistical observations of the categorical variables evaluated by using chi Square test.
The level $P < 0.05$ was considered as the cut off value or significance.

III. Results

Gastro-duodenal, ileal and appendicular perforation accounts for, 47%, 41% and 9.8% while only 2% and 6% case of caecal and traumatic perforation were recorded. Male to Female ratio is 2.18:1.Operative procedure simple closure of perforation done in 18%, resection and anastomosis in 12%, appendectomy in 1%, ieostomy was created in 14% and Grahm's patch for gastroduodenal perforation was done in 47.05% of patient. Most common post-operative complication was wound infection, present in 64.8% of patients. Morbidity and mortality occurs in 66.67% and 15.6% of total patients. Mean duration of hospital stay was 17.34 day**.** Out of 41 patients who came for follow up after 1weak, 3 patients still had wound infection. Out of 30 patients who came for follow up at 4 weeks interval 4 patients had obstructive symptoms and were re-admitted and treated conservatively. 2 patients had developed incisional hernia.
Factor affecting morbidity and mortality
No association of Age in relation to outcome was found.

Table 1: Relation of Age with post operative outcome and complications

Age in years	12-20	21-30	31-40	41-50	51-60	P value
No. of patient	12	15	9	5	10	
Wound infection	8	8	7	3	8	0.672
Wound dehiscence	2	1	1	0	3	0.433
Severe sepsis/MODS	0	0	2	1	3	0.076
Pulmonary complication	1	3	2	1	3	0.792
Leak/ fistula	0	0	0	1	1	0.208
Mortality	1	1	2	2	2	0.395

There is significant association between wound dehiscence and female gender, but insignificanct in mortality Incidence of wound dehiscence is more in female patients.

Table 2: Relation of gender with post operative outcome and complications

Gender	Male	Female	p value
No. of patient	35	16	
Wound infection	25	8	0.137
Wound dehiscence	2	5	0.014
Severe sepsis/MODS	4	1	0.564
Pulmonary complication	6	4	0.512
Leak/ fistula	1	1	0.516
Mortality	0	8	0.672

Significant association was also observed between hypotension and severe sepsis/MODS, pulmonary complication, and mortality rate with 'p' value 0.009, 0.003 and 0.009 respectively.

Table 3: Relation of blood pressure with post operative outcome and complications

Blood pressure systolic (mm Hg)	$\leq$ 90mm Hg	> 90 mm Hg	p value
No. of patient	9	42	
Wound infection	4	29	0.161
Wound dehiscence	1	6	0.082
Severe sepsis/MODS	3	2	0.009
Pulmonary complication	0	2	0.003
Leak/ fistula	0	2	0.504
Mortality	4	4	0.009

The mortality rate in patients with Hb < 10 gm% is 27% whereas in patients having Hb $\geq$ 10 gm% it was 12.5%

Table 4: Relation of blood hemoglobin level with post operative outcome and complications

Blood Hemoglobinlevel	< 10gm%	$\geq$ 10 gm%	p value
No. of patient	11	40	

Wound infection	9	24	0.123
Wound dehiscence	3	4	0.194
Severe sepsis/MODS	0	5	0.192
Pulmonary complication	4	6	0.351
Leak/ fistula	0	2	0.424
Mortality	3	5	0.310

Significant association of hypoalbumenia with reference to wound dehiscence and pulmonary complications with 'p' value of 0.02 and 0.013 respectively.

Table 5: Relation of serum Albumin level with post operative outcome and complications

Serum Albumin level	< 3gm/dl	≥ 3gm/dl	p value
No. of patient	23	28	
Wound infection	16	17	0.510
Wound dehiscence	6	1	0.020
Severe sepsis/MODS	4	1	0.099
Pulmonary complication	8	2	0.013
Leak/ fistula	2	0	0.111
Mortality	6	2	0.640

Patients having serum creatinine ≥ 1.2 mg/dl had a mortality rate of 33.3% compared to 10.25% of the patients having serum creatinine <1.2 mg/dl

Table 6: Relation of Serum Creatinine level with post operative outcome and complication

Serum Creatinine level	≥ 1.2mg/dl	< 1.2mg/dl	p value
No. of patient	12	39	
Wound infection	6	27	0.164
Wound dehiscence	3	4	0.241
Severe sepsis/MODS	2	2	0.268
Pulmonary complication	4	6	0.503
Leak/ fistula	2	0	0.061
Mortality	4	4	0.108

Mortality is significantly higher in patient operated after 24hrs with 'p' value of 0.037.

Table 7: Relation of Duration of Presentation with post operative outcome and complication

Duration of Presentation	≤ 24 hrs	> 24hrs	p value
No. of patient	16	35	
Wound infection	12	21	0.298
Wound dehiscence	1	6	0.294
Severe sepsis/MODS	1	4	0.159
Pulmonary complication	1	9	0.104
Leak/ fistula	0	2	0.329
Mortality	0	8	0.037

Mortality rate was 12.5% in the gastro-duodenal perforation while ceacal and appendicular perforations had no mortality.

Table 8: Relation of Site of Perforation with post operative outcome and complication

Site of perforation	Gastroduodenal	Ileal	Caecal	Appendicular
No. of patient	24	21	1	5
Wound infection	18 (70.8%)	13 (66.66)	1 (100%)	1 (20%)
Wound dehiscence	2 (8.33%)	5 (23.80)	0	0
Severe sepsis/MODS	2 (8.33%	3 (14.2)	0	0
Pulmonary complication	6 (25%)	4 (19%)	0	0
Leak/ fistula	2 (8.33)	0	0	0
Mortality	3 (12.5%)	5 (23.8%)	0	0

Mortality rate in the patients who had primary closure was 33.33% whereas in Ileostomy and resection and anastomosis patients it was 14.3% and 16.6% respectively.

Table 9: Relation of Operative procedure with post operative outcome and complication

Site of perforation	Grahm's Omental patch	Primary Repair	Ileostomy	Resection and Anastomosis	Appendectomy
No. of patient	24	9	7	6	5
Wound infection	18 (75%)	6 (66.66%)	4 (57%)	4 (66.66%)	1 (20%)
Wound dehiscence	1 (4.1%)	3 (33.33%)	3 (43%)	0	0
Severe sepsis/MODS	2 (8.2%)	2 (22.22%)	0	1 (16.60%)	0
Pulmonary complication	6 (25%)	2 (22.22%)	1 (14.3%)	1 (16.60%)	0
Leak/ fistula	2 (8.2%)	0	0	0	0

Mortality	3 (12.7%)	3 (33.33%)	1 (14.3%)	1 (16.60%)	0

IV. Discussion

Peritonitis is a commonly encountered surgical emergency in developing countries like India. In most of the cases, presentation to the hospital is delayed with well-established generalized peritonitis. The perforations of proximal gastrointestinal tract are significantly more common in the developing countries in contrast to studies from developed countries like United States, Europe and Japan which have relatively higher incidence of distal gastrointestinal perforations. In the present study the site of perforation co related with finding observed by Garg et al[3] .

Site	Garg et al[58]	Present study
Gastro-duodenal	58.48%	47%
Ileal	32.85%	41%
Appendicular	4.33%	9.8%

In our study male to female ratio is 2.18:1 with male predominance of 68.6%. Several studies had also observed that male patients outnumber the females in cases of perforation peritonitis such as Mathur and Sharma[4] and Huttunen et al[8] .In perforation peritonitis abdominal pain is universally present in all the cases. Apart from abdominal pain other symptoms are vomiting, altered bowel habits and fever. Similar findings were also noted in other studies such as Patel et al[7] Paryani et al[5] and Jain et al[2] In our study we had found no association of age in terms of factor affecting outcome which is similar to study of Singh et al[6]. Though Garg et al[3] observed higher mortality in age group > 60 years. Hypotension at the time of admission was observed as a major factor affecting both morbidity and mortality similar to the study done by Paryani et al[5]. The mortality rate in patients with Hb < 10 gm% is 27% whereas in patients having Hb $\geq$ 10 gm% it was 12.5% Similar findings were observed in the study done by Lal Mani Singh et al[1]**.**Serum albumin has significant association with reference to wound dehiscence and pulmonary complications with 'p' value of 0.02 and 0.013 respectively. We also noted that there is increased incidence of leaks, severe sepsis and longer hospital stay in patients with serum albumin < 3 gm/dl**.** In our study patients with deranged renal functions i.e. serum creatinine > 1.2 mg/dl had a higher mortality rate Similarly to Paryani et al[5]. Mortality is significantly higher in patient operated after 24hrs with 'p' value of 0.037 in our study. Garg et[3] al and Lal Mani Singh et al[1] also concluded, that patients who were operated early has more favorable outcome.We also found that patients with appendicular perforation has lower rate of morbidity with no mortality. Morbidity rate was more or less similar in cases of gastro-duodenal perforations and ileal perforations,. In the cases of ileal perforations, lowest complication rate was seen in patients where resection and anastomosis was done. In our study highest mortality rate was observed in the ileal perforation cases which was 23.8%, that too amongst the patients who had primary closure 33.33%. Thus creation of ileostomy in selected patients who has gross peritoneal contamination and fragile bowel can reduce morbidity and mortality. Resection and anastomosis is an acceptable procedure in favorable patients like early presenters, lesser peritoneal contamination and hemodynamic stability. Mortality rate was 12.5% in the gastro-duodenal perforation group while ceacal and appendicular perforations had no mortality. Singh et al[6] observed mortality rate of 13.6%, 33.3% and 5.1% for Ileostomy, resection & anastomosis and primary closure respectively.

V. Conclusion

Simple repair is the recommended procedure in most of the cases, but more definite resection and anastasmosis can be justified in patient with favourable outcome. In gross peritoneal contamination, stoma formation should be procedure of choice. Delay in presentation, hypotension at time of admission, hypoalbumenia, site of perforation and type of operative procedure performed are significant factors affecting the morbidity and mortality in case of perforation peritonitis

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Dr Krishna Kumar Bharang. "A Clinical study on Perforation Peritonitis patients to assess its Morbidity & Mortality." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 17.4 (2018): 18-21.