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A RETROSPECTIVE STUDY OF PROGNOSTIC FACTORS IN CASES OF ACUTE GENERALISED PERITONITIS

General Surgery

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ABSTRACT

Background: Peritonitis is defined as inflammation of the serosal membrane that lines the abdominal cavity and the organs contained therein. Peritonitis as an important entity,is actively associated with acute abdominal catastrophes . Despite advances in surgical techniques, antimicrobial therapy and intensive care support, management of peritonitis continues to be highly demanding, difficult and complex.

Methods: A retrospective study was carried out in tertiary teaching care hospital Dehradun,Uttarakhand to evaluate the various prognostic factors in cases of acute generalised peritonitis.

Results: A total of 50 cases were included in the study. Maximum incidence of peritonitis was found in 21to 30 years age group. There was male predominance (male to female ratio was 4:1).The causes of peritonitis in order of frequency were duodenal ulcer perforation (32%),traumatic abdominal injury (16%),appendicular perforation (14%),ileal perforation(10%), large gut perforation(6%).Pain was the leading symptom found in 94.6% of cases followed by abdominal distension (80%). The positive culture from peritoneal fluid was noted in 80% of the patients .E.coli was the commonest infecting organism (74%) followed in order of frequency by ps pyocyneus (18%), staph aureus (16%). The overall mortality in acute generalized peritonitis was 28%. The highest mortality was recorded in the seventh decade of life .Timing of surgical intervention within 24 hours gave better prognosis. APACHE II score is effective in identifying the group of patients at risk and to predict death. The Mannhein Peritonitis Index (MPI) has been shown to provide accurate assessment of the severity of peritonitis in these patients.

Conclusions: Prognosis in acute generalized peritonitis can be improved by early detection of certain risk factors and instituting early and prompt treatment thereby reducing the incidence of high mortality

KEYWORDS

Peritonitis, prognostic factors, mortality, Mannheim Peritonitis Index, APACHE score.

INTRODUCTION

Peritonitis is defined as inflammation of the serosal membrane that lines the abdominal cavity and the organs contained therein[1]. Peritonitis as an important entity,is actively associated with acute abdominal catastrophes. Peritonitis is most commonly caused by perforation of the hollow viscus, rarely from blood borne infection or from female genital tract as ascending infection[1]. Smoking, use of non-steroidal anti-inflammatory drugs, chronic Helicobacter pylori infection, excessive alcohol, coffee, and stress are important risk factors for perforation[2-5]

Usually peritonitis resulting from acute abdominal catastrophes are localized to start with, which subsequently becomes generalized, if body defence mechanism fails. Most cases of acute generalized peritonitis are secondary to a definite lesion inside the abdomen which precipitate the process, unlike, primary peritonitis where there is no definitive causative lesion amenable to surgery.

In general ,the term peritonitis refers to a constellation of sign and symptoms ,which includes abdominal pain and tenderness on palpation, abdominal wall muscle rigidity and systemic signs of inflammation . Patients may present with and acute or insidious onset of symptoms, limited and mild disease ,or systemic and severe disease with septic shock.

Peritoneal infections are classified as primary (i.e spontaneous), secondary i.e. related to a pathologic process in a visceral organ or tertiary(i.e. persistant or recurrent infection after adequate initial therapy).Untreated cases of acute peritonitis may be fatal . The overall mortality figure of intra-abdominal infections is still as high as 40%, though it has been brought down steeply from 90% at the start of the century to 10-20% today by better understanding of the pathophysiology of peritonitis , management of fluid and electrolytes imbalance blood transfusion and appropriate antibiotics administration.

This reduction in mortality cannot be ascribed to surgery alone . Various factors which govern the mortality and morbidity has initiated the surgeon to study the different prognostic factors associated with acute generalized peritonitis and also to differentiate cases where surgical intervention is necessary from those with primary or granulomatous peritonitis where surgery is not required.

Among various prognostic factors ,the important ones are age and sex of the patient, body temperature, and white blood cell count , heart rate, mean blood pressure and hematocrit, blood urea, serum creatinine, electrolytes, serum albumin level, body mass index(BMI) ,causative lesion , virulence of the organism , time travel between onset and surgical intervention. If these factors are detected early and attention given at an early stage, then morbidity and mortality due to peritonitis can be reduced to minimum.

The high mortality and the lack of reliable prognostic parameters justify the study and application of indices of severity and prognostic models in patients with intra abdominal sepsis. APACHE II and the MPI have been combined to improve prediction of the outcome. Utilization of scoring systems enables stratification of abdominal sepsis according to the severity, high degree prognostification, identification of patients at high risk, patients randomization for clinical trials, comparison between groups of patients with similar diseases , clinical audit of treatment efficacy and standards of care , repetitive assessment to monitor the course of the disease and the response to treatment .

METHODS

A retrospective study was conducted in the surgery department of a tertiary teaching care hospital, from 1st August to 31st January 2019. The diagnosis of peritonitis was made on the basis of detailed history ,clinical examination routine as well as special investigations and finally confirmed intra-operatively.

The operative findings were noted and the post operative management, complications morbidity and mortality were recorded till the stay in hospital

Inclusion criteria : peritonitis resulting from primary intraabdominal causes or following trauma.

Exclusion criteria : peritonitis occurring as a complication of surgery (postoperative peritonitis).

Statistical Analysis

The results are presented in terms of percentage. The values were analyzed using the Chi-square test. A p- value of< 0.5 was considered statistically significant.

RESULTS

Maximum incidence of peritonitis was found in 21 to 30 years age group. There was male predominance 4:1(Table 1)

The causes of peritonitis in order of frequency were duodenal ulcer perforation (32%),traumatic abdominal injury(16%), appendicular perforation (14%), ileal perforation(10%), large gut perforation (6%), gastric ulcer perforation (4%),Jejunal perforation (4%),acute haemorrhagic peritonitis (4%), primary peritonitis (2%),gall bladder perforation(2%), ruptured ectopic (4%)and ruptured uterus (2%).(Table 2)

Pain was the leading symptom found in(94.6%) of cases followed by abdominal distension (80%), vomiting(74.6%) , constipation(49.3%), Fever (42.6%) etc. while abdominal distension (86.6%) was the leading sign followed by tenderness (70.6%)rigidity(60%), absent bowel sound (82.6%), obliteration of liver dullness (53.3%) rebound tenderness (41.3%) and tenderness on digital examination (42.6%)

The important radiological findings were gas under diaphragm (42.6%), multiple fluid gas levels (26.6%), hazy appearance (8%) , pneumatic type appearance (5.3%) and inconclusive (22.6%).

The positive culture from peritoneal fluid was noted in 80% of the patients (Figure1)

E.coli was the commonest infecting organism (74%) followed in order of frequency by ps pyocyneus (18%), staph aureus (16%), B.fragilis (10%) , strept. pyogenes (8%), K.Pneumonia (4%), strept faecalis (4%), clostridium welchi (2%) etc.

The overall mortality in acute generalized peritonitis was 28% .(Figure 2)

The highest mortality was recorded in the seventh decade of life . (Table 3)

Large bowel perforation cases were met with maximum mortality (66.66%) followed in order of frequency by jejunal perforation (50%) ,acute haemorrhagic perforation, pancreatitis(50%), traumatic abdominal injury (37.5%), duodenal ulcer (31.25%),ileal perforation (20%)and appendicular perforation (14.28%). C.welchi (100%), B.Fragilis80%,Ps.Pyocyaneus 66.6%) P vulgaris (50%),K. Pneumonia 50% were associated with very high mortality followed by E.coli 37.83% ,strept pyogenes 25% etc.

Mortality associated with single organism infection was 16.66 %, which rose to 42.85% with multiple organism.(Table 4)

The mean levels of serum bilirubin, serum alkaline phosphatase and serum creatinine were significantly higher in the mortality group as compared to survivor group (Table 5).

Timing of surgical intervention within 24 hours gave better prognosis, with mortality of 12.5%. The mortality sharply raised to 63.6% when operation was done after 48 hours. (Table 6)

APACHE II score is effective in identifying the group of patients at risk and to predict death. There was no death among the patients who scored 0-4, whereas mortality was 13.3% in those who scored 5-9, 43.3% in those who scored 10-14, 50% in patients who scored 15-19 and 100% in patients who scored >19. (Table 7)

The MPI has been shown to provide accurate assessment of the severity of peritonitis in groups of patients. The mortality was 3.8% in those who scored 0-21, 51% in those who scored 21-29 and 71.4% in patients who scored >29 (Table 8).

DISCUSSION

In this study the prognostic factors in cases of acute generalized peritonitis were studied.

The study included a total of 50 cases with the age ranging from 3 years to 80 years. The highest incidence was found in the age group of 21-30 years i.e third decade of life (34%) followed by 18% in fourth decade. The sex incidence in present series shows a male preponderance with the ratio being 4:1 .This is in agreement with a study conducted by Stewart D J et al[6] .

Pain was the commonest symptom (94.6%) and abdominal distension was commonest sign (86.6%). Similar pattern was observed in a study by Dickson et al[7] .

In our study 80% yielded positive culture (showing growth of organism). This higher incidence of positive culture might be due to late presentation of most cases. However amongst the negative culture, most were due to injuries which reached hospital with in 6-12 hours and had no time for bacterial over growth . Ecoli was the commonest pathogen .This is similar to the results of the study by Altermeir WA and Wittmann DH et al[8,9].

In our study, increased mortality was observed between 71-80years age group which is in accordance with studies done by Khosrovanic et al[10]. Incidence of mortality due to multiple organisms was significantly higher in comparison to that by single organism which is similar to study conducted by Ger R et al.[11]

In our study it was observed that when serum bilirubin levels raised above 2 mg/dl, the mortality raised to 63.6% and similarly when serum creatinine was raised above 1.5 mg% ,the mortality raised to 66.66% , which is similar to study conducted by Ger R et al , Bohenen et al, Altaca G et al and Mishra et al.[11,12,13,14]

Prognosis in peritonitis is bad when there is a delay between onset of symptoms and timing of surgical intervention . In our study mortality sharply rose to 63.6%, when surgical intervention was delayed for more than 48 hours. This is similar to the studies conducted by Bohenen et al.[12]

To know the prognosis of the patients using APACHE II score ,no deaths were observed among the patients who scored 0-4 whereas mortality was 13.3% in those who scored 10-14 , 50% in patients who scored 15-19 and 100% in patients who scored >19. This is in accordance with the studies conducted by Adesunkahmi Abdul Rashid K et al[15]

In our study , mortality was 3.8% with MPI <21, 50% in those who scored 21-29 and 71.4% in patients who scored >29 , similar to study conducted by Biling A et al , Notash AY et al[16,17].

CONCLUSION:-

Perforation peritonitis is most commonly present in males with an average age of 36 yrs.

Mortality and morbidity is relatively higher in older age groups Inaccessibility to hospitals and delay in resuscitation adds to a worse outcome. So, there is a need to educate health professionals at peripheral centers about this condition in order to make the patients reach the tertiary centre as early as possible.

Prognosis in acute generalized peritonitis can be improved by early detection of certain risk factors and instituting early and prompt treatment thereby reducing the incidence of high mortality.

DECLARATIONS

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Ethical approval: Not required

Table 1 Age and Sex Distribution

Age (Years)	No.of cases		N(%)
	Male	Female	
0-10	2	0	2(4)
11-20	4	1	5(10)
21-30	15	2	17(34)
31-40	8	1	9(18)
41-50	6	1	7(14)
51-60	3	3	6(12)
61-70	2	1	3(6)
71-80	1	0	1(2)
Total	41(82%)	9(18%)	50(100)

Table 2 Incidence of peritonitis due to various causes

Causes of peritonitis	No.of cases	Percentage
Gastric ulcer perforation	2	4
Duodenal ulcer perforation	16	32

Appedicular perforation	7	14
Traumatic abd. Injury	8	16
Ileal perforation	5	10
Large gut perforation	3	6
jejunal perforation	2	4
Primary peritonitis	1	2
Gall bladder perforation	1	2
Acute haemorrhagic pancreatitis	2	4
Ruptured ectopic	2	4
Rupterd uterus	1	2
Total	50	100

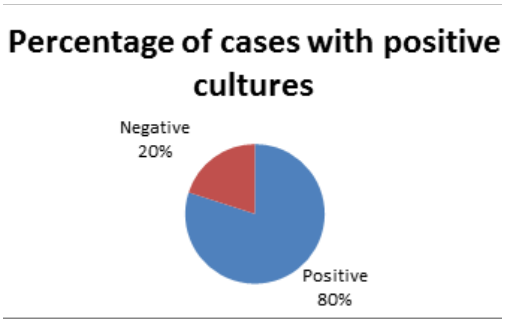

Fig1:- Percentage of positive cultures

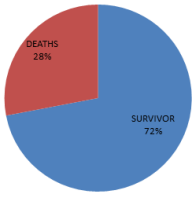

Fig 2 :- INCIDENCE OF MORTALITY IN PERITONITIS

Table 3:- Incidence of mortality in different age groups.

Age group	No.of cases	Death	Percentage of mortality
0-10	2	1	50
11-20	5	1	20
21-30	17	3	17.6
31-40	9	2	22.2
41-50	7	1	14.2
51-60	6	3	50
61-70	3	2	66.66
71-80	1	1	100

Table 4:- Incidence of mortality due to single or multiple organism

Organism	No.of cases	Death	Percentage of mortality
Single	12	2	16.66
multiple	28	12	42.85

Table 5:- Range and Mean values for Serum Bilirubin and Serum Alk. Phosphatase and Serum Creatinine .

	S.Bilirubin (mg/dl)Mean ± SD (Range)	S.Alk.Phosphatase (K.A.unit) Mean±SD (Range)	S. Creatinine (mg/dl) Mean±SD (Range)
survivor	1.27± 0.75 (0.3-4.1)	9.80±3.1 (4.1-16.1)	1.5±1.0 (0.8-4)
Death	2.54±1.09 (0.7-4.4)	17.74±4.55 (7.5-24.9)	2.5 ±2.0 (1-5)

Table 6:- Mortality depending upon the time interval between onset of symptoms and operation

Timing of surgical intervention in hours	No. of cases	No. of deaths	Percentage
0-24	16	2	12.5
24-48	23	5	21.7
More than 48 hours	11	7	63.6

Table 7:- Relationship of APACHE II score and Mortality in patients with peritonitis

APACHE II SCORE	NO.of Patients	No. of Death	Mortality %
0-4	2	-	0
5-9	15	2	13.3
10-14	30	13	43.3
15-19	26	13	50
>19	2	2	100

Table 8 :- Relationship of Manheim Peritonitis Index (MPI) and Mortality in patients with peritonitis

MPI	No. of patients	No.of deaths	Mortality
<21	26	1	3.8
21-29	14	7	50
>29	7	5	71.4

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