

Study on Factors Effecting Outcome of Abdominal Emergencies Presenting With Peritonitis

¹DR.M.Sri sailaja rani, ²DR. K.S.Satya vani,

^{1&2}Associate professor, Department of general surgery, Rangaraya Medical College, Andhra Pradesh, India
Corresponding author: Dr K S Satyavani

Abstract

BACKGROUND: Peritonitis is defined as, inflammation of peritoneum. Despite the surgical treatment, sophisticated intensive care units, broad spectrum antibiotics and a better understanding of pathophysiology, the mortality rates of peritonitis are still high and its treatment had been a challenge. Hence management continued to be a highly challenging task demanding proper knowledge, experiences, continued care and close monitoring. The outcome of an abdominal infection depends on the complex interaction of many different factors and the success obtained with the early institution of specific therapeutic procedures. It also depends upon the exact recognition of the seriousness of the diseases and an accurate assessment and classification of the patient's risk.

PATIENTS AND METHODS: This is a study of 121 patients who presented with peritonitis to Tertiary care teaching hospital between august 2014 to july 2016 who subsequently underwent surgical intervention. All these patients have been thoroughly assessed both preoperatively and postoperatively. Mortality was documented with in first week after surgery.

RESULTS: In our study the incidence of male sex was 73% while that of female sex was 27%, giving a male female ratio of 2.7:1. 21 patients died (overall mortality 17.3%). In males the mortality was 16% while in the females 21%. 34 patients had evidence of organ failure out of which 16 patients died (mortality 47%). Out of 62 patients with a pre-operative duration of greater than 24hr, 21 died thus resulting in mortality 34%. 5 patients there was presence of malignancy of which 2 patients died (mortality 40%). The mortality in the colonic origin of sepsis was 60% while in the latter 13%.

CONCLUSION: Hence elderly age, female sex, presence of organ failure, pre operative duration more than 24 hours, presence of malignancy and colonic origin of sepsis are recognised as high risk factors. Presence of these factors should be identified, and patients should be categorised as high risk and should be provided intensive care.

Key words: factors, outcome, peritonitis, perforation, sepsis.

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I. Introduction

Peritonitis is defined as, inflammation of peritoneum, the tissue that lines inner wall of abdomen and covers and supports most of the abdominal organs. If left untreated it can rapidly lead to sepsis and multiorgan failure. Most cases of peritonitis are caused by an invasion of the peritoneal cavity by bacteria. Despite the surgical treatment, sophisticated intensive care units, broad spectrum antibiotics and a better understanding of pathophysiology, the mortality rates of peritonitis are still high and its treatment had been a challenge. Hence management continued to be a highly challenging task demanding proper knowledge, experiences, continued care and close monitoring. The outcome of an abdominal infection depends on the complex interaction of many different factors and the success obtained with the early institution of specific therapeutic procedures. It also depends upon the exact recognition of the seriousness of the diseases and an accurate assessment and classification of the patient's risk.

Early prognostic evaluation of peritonitis is desirable to select high risk patients for more aggressive therapeutic procedure such as radical debridement, lavage system, open management and planned re-laparotomy. An accurate risk assessment is the only way to settle a standard of comparison between group of patients and different treatment methods which would allow prospective adequate comparative studies. There is no single, easily available laboratory test that predicts severity or prognosis in patients with peritonitis. A thorough knowledge of

risk factors allows a surgeon to determine the severity of intra-abdominal infections are essential to rectify the effectiveness of different treatment regimens, to scientifically compare surgical intensive care units, to select a more aggressive surgical approach for high risk patients and to able to inform patient's relatives with greater objectivity.

The results of treatment differ for peritonitis is especially difficult to evaluate because these patients may correspond to various etiologies, treatment differ and there is a lack of universally valid criteria and definitions. Identifying both prognostic factors and severity scales that provide objective description of the patient condition specific points such as the preoperative and postoperative periods is useful to improve our understanding of the problem involved.

Intra-abdominal infection and secondary peritonitis are a frequency encountered surgical emergency in tropical countries. The spectrum of perforation peritonitis in India continues to be different from its western counterparts. In India, the most commonly affected population is the young men in the prime of their life as compared to the west where the mean age for the occurrence of perforation peritonitis is usually 45-60 yrs. In majority of cases the presentation to the hospital is late with established generalized peritonitis with fecal or purulent contamination and varying degree of septicaemia. In India perforations of the proximal gastrointestinal tract were more common as compared to the distal ones.

Despite advances in risk assessment and treatment, mortality from many forms of intra-abdominal infection remains unacceptably high.

Substantial differences between conventional & more recently developed therapy has been found in randomized prospective studies.

AIM

To study the factors affecting outcome in peritonitis

OBJECTIVES

Outcome is studied as mortality in immediate postoperative period i.e., 1 week.

Primary objective –

to study the factors affecting outcome in peritonitis.

Secondary objectives –

to study spectrum of peritonitis

to identify patients at high risk.

Factors affecting outcome are studied as

Modifiable

Pre operative duration

Organ failure

Non modifiable

Age

Sex

Malignancy

Cause of peritonitis.

II. Methodology

a. SOURCE OF DATA

Patients admitted under various surgical units from august 2014 to july 2016, at Tertiary care teaching hospital Only the cases of peritonitis undergone surgical management are studied in detail according to the proforma given.

A study was carried out on these patients. 121 patients were admitted with biliary obstruction and were studied in detail.

METHOD OF COLLECTION OF DATA

This is a study of 121 patients who presented with peritonitis between august 2014 to july 2016 who subsequently underwent surgical intervention. All these patients have been thoroughly assessed both preoperatively and postoperatively. Mortality was documented with in first week after surgery. Photographic documentation has been done wherever possible. Where patients underwent surgical intervention, any tissue removed was subjected for histopathological examination.

INCLUSION CRITERIA

Cases of peritonitis secondary to various etiologies attending tertiary care teaching hospital in the study period were included in the study.

EXCLUSION CRITERIA

Patients absconded or Left against medical advice (LAMA) during hospital admission. All patients with primary peritonitis (spontaneous bacterial peritonitis)

All patients with tertiary peritonitis – patients with peritonitis due to anastomotic dehiscence or leak

-Patients with acute appendicitis (without perforation)

Diagnosis was made by a combination of history, clinical examination and on the basis of reports of radiological examinations after which the patients is posted for emergency laparotomy.

III. Results

A total of 1, 25,263 cases were admitted to the hospital during the study period, out of which 12,877 (10.3%) were admitted under the department of surgery, of which 121 constituted the study group. The criteria mentioned in materials and methods were followed and results noted.

Age distribution:

The mean age of the study group was 45years years and the age group of 46-60 contains maximum (35%) patients followed by 31 – 45 years. Oldest patient was 87 and youngest was of 8 years.

Table 1: number of patients in each age group

AGE GROUP (YEARS)	FREQUENCY	PERCENT
<15	8	7%
16-30	14	12%
31-45	38	31%
46-60	43	35%
61 and above	18	15%

Table 2: Showing sex distribution of the patients

Sex	Frequency	Percent
Male	88	73%
Female	33	27%

Clinical features:

Table 3: Showing various clinical features in patients with peritonitis

Symptoms		Frequency	Percent
Abdominal pain	Absent	0	0.0
	Present	121	100
Distension	Absent	66	54.5
	Present	55	45.5

flatus	Absent	39	32
	Present	82	68
stools	Absent	43	35.5
	Present	78	64.5
Fever	Absent	52	47
	Present	69	53
Vomiting	Absent	78	64.5
	Present	43	35.5

Organ failure:

Table 4: Showing distribution of organ failure in patients with peritonitis

Organ failure	Frequency	Percent
Absent	87	72
Present	34	28

Cause of peritonitis

Table 5: showing cause of peritonitis

Cause of peritonitis	frequency	percentage
Duodenal perforation	68	56
Gastric perforation	5	4
Jejunal perforation	4	3
Ileal perforation	7	6
Caecal perforation	2	2
Gangrenous bowel	7	6
Acute appendicular perforation	13	11
Colonic perforation	8	7

Ruptured liver absces	5	4
Ruptured Splenic abscess	1	1

Malignancy:

Table 6: showing presence of malignancy

Malignancy	Frequency	Percent
Absent	116	96
Present	5	4

Pre operative duration:

Table 7: showing per-operative duration wise distribution of patients

	Pre-operative duration	Frequency	Percent
1.	<24 hours	59	49
2.	24 hours and more	62	51

Type of procedure:

Table 8: showing various intra-operative procedures done

Intra-operative procedures	Frequency	Percent
OMENTAL PATCH REPAIR	82	68
LAPAROTOMY AND DRAINAGE	6	5
RESECTION & ANASTOMOSIS	10	8
APPENDECTOMY	13	11
COLOSTOMY OR ILEOSTOMY	10	8

Outcome:

Table 9: Showing outcome of the patients in our study

Outcome	Frequency	Percent
Discharged	100	83
Death	21	17

Mortality :

Table 11: Showing correlation of sex with incidence of mortality

Sex	Total	Outcome		Mortality as per age
		Discharged	Death	
Male (n)	88	64	14	14
%	100%	73	16	67
Female (n)	33	26	7	7
%	100%	79	21	33

IV. Discussion

SPECTRUM OF PERITONITIS :

AGE:

Total of 121 patients were studied.

The age range is from 8 years to 87 yrs. The mean age of the study population was 45 years

The highest numbers of patients were found in the age group of 46-60 yrs and they constitute about 31.3% of the study population. The number of patients in the age group <15 yrs were 8 i.e. 7% ,16-30 yrs were 14 i.e 12%,31-45 yrs were 38 i.e 31%,46-60 yrs were 43 i.e 35% and patients of the study population i.e. 15% were in the age group >60 yrs.

The increased prevalence of the perforation in the age group of 31-60 yrs in our study can be attributed to the fact that gastro duodenal perforations due to peptic ulcer disease is a major cause of peritonitis in our study and the increased prevalence of the etiological risk factors such as smoking, alcoholism and NSAID abuse in this age group.

After increasing steeply at the beginning of the twentieth century, perforation incidence during the last decade has declined in young and has risen among elderly.

Sex

In our study the incidence of male sex was 73% while that of female sex was 27%. In a study by Rajender Singh Jhobta¹ (2006) regarding the spectrum of perforation peritonitis in India 84% patients were male.

AUTHOR	YEAR	FEMALE	MALE
Tripathi et al	1993	45.5%	54.5%
Yilmazlar et al	1999	37%	63%
Corriea et al	2001	26.7%	73.3%
Rudolfo L et al	2002	48%	52%
Basnet RB	2010	42%	58%
Samir Delibegovic	2011	37.25%	62.75%
Adolfo Pisanu	2011	43.6%	56.4%

Ahmer A Memon	2012	23%	77%
Amri Mabeva	2015	35%	65%
Present study	2016	27%	73%

In a study by Rajender Singh Jhobta¹ regarding the spectrum of perforation peritonitis in India, 422 of the 504 patients studied were males i.e. 84%.

In a study by Rudolfo L² (2004) out of the 174 patients, 84 were females (48%) and 90 were males (52%).

In a study by Amri Mabeva (2015) out of 100 patients, 35 were females and 65 were males.

The increased prevalence of male sex in our study is mainly due to increased number of male patients in the category of duodenal perforation

V. Cause Of Peritonitis

In our study duodenal perforation account for 56%, appendicular perforation for 11%, colonic perforation for 7%, ileal perforations for 6%, gangrenous bowel is responsible for 6% cases, gastric perforation for 4%, ruptured liver abscess for 4%, jejunal for 3%, caecal perforation for 2%, and splenic abscess for 1% of patients.

In a study by Rajender Singh jhobta¹ et al (2006) the result was as below:

Duodenal 57%, gastric 8%, jejunal 3%, ileal 15%, appendicular 12%, colonic 4% and oesophageal 0.5%.

SITE	TRIPT HI et al (1993)	KACHRO O et al (1984)	BOHNE R et al (1999)	Basn et RB ³ (2010)	Ahmer A Memon (2012)	Amri Mabeva et al (2015)	Prese nt Study
Duodenal	15%	18.7%	22.7%	6%	11.9	18%	56%
Ileal	24.5%	15%	-	26%	59%	15%	3%
Appendicul ar	10%	41.1%	15.9%	16%	15%	23%	11%
Others	50.5%	25.2%	61.4%	52%	14.1	44%	30%

In a study by Rodolfo L² et al appendicular perforation constitute 48.28% while gastric pathology and small bowel pathology constitutes 2.8% each and colonic pathology 2.30%.

The increased number of duodenal perforations in our study is due to increased prevalence of the acid peptic disease. this shows peptic ulcer disease is still a major cause of peritonitis and more aggressive treatment protocols are necessary to reach all the sectors of people.

Also there increase in number of jejunal perforation 3 of which were secondary to trauma reveals the hazard of trauma. only one case of jejunal perforation was associated with tuberculous abdomen.

A higher preponderance of appendicular perforation in comparison to ileal perforation shows decreased incidence of typhoid perforation.

Small bowel was most common to undergo gangrene, with equal incidence of of ladd's bands and tuberculous abdomen.

Early diagnosis and treatment of liver abscess should be undertaken to prevent its rupture.

VI. Clinical Features

In case of peptic ulcer perforations, pain abdomen and vomiting were the predominant symptoms. Tenderness, guarding rigidity, obliteration of the liver dullness were the predominant signs. Peritonitis is a life threatening complication of peptic ulcer disease.

Diagnosed is made clinically and confirmed by the presence of pneumoperitoneum on radiographs in case of hollow viscus perforation. Ruptured liver and splenic abscess, acute appendicular perforation cases had their diagnosis confirmed by ultrasound of abdomen. Peritonitis due to gangrenous bowel is confirmed intraoperatively.

The success of proton pump inhibitors and the eradication of *H. pylori* have virtually eliminated the need for elective ulcer surgery. Perforated peptic ulcer is a common surgical emergency and a major cause of death in elderly patients. Perforated peptic ulcer is becoming common in older patients and associated with a higher incidence of recent consumption of non steroidal anti inflammatory drugs (NSAIDs)

Operative management consists of time honoured practice of omental patch closure.

Spontaneous ileal perforation is a serious complication of a variety of diseases. In the developed countries these perforations are mostly

because of foreign bodies radiotherapy, drugs, Crohn's disease, malignancies and congenital malformation. In tropical countries small bowel perforation is a commonly encountered surgical emergency. Although tuberculosis is an important cause, the most important is typhoid fever. Purohit⁴ reported the majority of perforations in the first week of fever while Eggleston and Santoshi⁵ reported 33% in the second week of fever. Absence of liver dullness was present in all the cases of ileal perforation. Nair SK et al. in their study of 50 cases demonstrated absence of liver dullness in 63.63% of cases. Gas under diaphragm in X-ray abdomen standing is an important finding and helpful in diagnosis.

Enteric perforations are best managed surgically as it prevents further peritoneal contamination by intestinal contents. Repair of perforation should be the choice of treatment in enteritis perforation because this is a simple quick and cost effective procedure. Ileostomy should be considered selectively in patients with multiple perforations and unhealthy gut. Resection however may be necessary for multiple perforations.

In our study pain in abdomen was the most common symptom and 100% of patients had pain abdomen at presentation while 32% of patients have difficulty in passing flatus.

Distension of abdomen was present in 55% of patients, 35.5% patients had episodes of vomiting, 53% patients had fever at presentation.

In a study by Shantanu kumar Sahu et al the commonest presenting symptom was abdominal pain (100%), followed by distension of abdomen (82%), constipation, vomiting and fever.

In a study by Rajender Singh Jhobta et al pain was present in 98% of patients, followed by vomiting (59%), abdominal distension (44%), constipation (58%), fever (35%), and diarrhoea (7%).

Perforation peritonitis is a clinical condition with a wide spectrum of presentation and high index of suspicion is always warranted.

Not every patient of perforation peritonitis will present with signs of pain, distension of abdomen, guarding and rigidity of the anterior abdominal wall. A thorough examination from head to toe is mandatory in every patient.

Diagnosis of perforation peritonitis is always clinical and immediate resuscitative measures should be initiated. Radiology investigations are only for the confirmation of diagnosis. Unnecessary investigations unless the diagnosis is in doubt should be avoided, and after initial adequate resuscitative exploratory laparotomy should be done in an emergency basis. Delay in treatment can lead to the development of sepsis and multi organ failure with concomitant increase in morbidity and mortality of patients.

VII. Intra Operative Procedure Done

All patients of perforative peritonitis were treated as a surgical emergency. Preoperatively all patients had broad spectrum antibiotic coverage, nasogastric suction and management of fluid and electrolyte imbalance and oxygen supplementation when necessary. Anaemic patients required blood transfusion. Postoperatively parenteral antibiotics were continued and after that oral antibiotics were given for 5 days.

EXPLORATORY LAPAROTOMY and OMENTAL PATCH were done in patients with duodenal perforation and gastric perforation accounting for 68% patients .

11 patients underwent appendectomy.

8% patients underwent resection and anastomosis, and in 8% patients colostomy/ileostomy was done along with resection and anastomosis.

5% patients underwent laparotomy and drainage.

In our study no patients were managed by a definitive procedure for acid peptic disease. All the patients with gastro duodenal perforation due to acid peptic disease were prescribed proton pump inhibitor at the time of discharge.

Primary closure of the gastric perforation with edge biopsy and omental patch was done in all of the cases of gastric perforation and 2 out of 5 cases had malignancy. and Graham's omental patch alone in duodenal perforations.

In the study by Rajender Singh Jhobta 304 patients i.e. 60% were managed by simple closure of perforations, 46 patients i.e. 9% were managed by resection and anastomosis. Resection without anastomosis was done in 64 patients; ileostomy/colostomy with mucous fistula/Hartmann's procedure was done in these patients. Definitive procedure in the form of billroth I and II gastrectomy with truncalvagotomy and drainage procedure was done in 33% patients and appendectomy in 57 patients.

DISTRIBUTION OF ORGAN FAILURE

In our study 34 patients i.e.28% of the study population shows evidence of organ failure at presentation.

30 patients presented with shock (BP ≤ 90mm Hg), 28 out of 47 had creatinine > 2 mg, 4 patients had abnormal liver function tests.

Distribution or organ failure in different studies are-

48.5% in MM Correia et al⁶

11.5% in Rodolf L et al⁷

20% in Murut Kologlu et al⁸

In peritonitis a systemic inflammatory response induced by the peritoneal infection may progress to septic shock and multiorgan failure. The high rate organ failure in our study denotes a delay in presentation of most cases.

Most of the patients with organ failure had colonic origin of sepsis and least rate of organ failure is found in patients of appendicular perforation.

PRE OPERATIVE DURATION

In our study 59 patients i.e. 49% presented within 24 hrs while 62 patients i.e. 51% presented after 24 hrs of onset of the disease

In other studies the distribution of preoperative duration is as below-

Study	<24hrs	>24hrs
[REDACTED]		
Rodolfo L ²	54.48%	49.42%
MM Correia ⁹	34.5%	65.5%

In our hospital the cause of delayed presentation i.e. preoperative duration of peritonitis more than 24 hrs was mainly related to the

Illiteracy among the study population

Lack of proper referral services

In some patients the delay was due to diagnostic dilemma which demands early use of more sophisticated investigations like CT scan, which is not available at the peripheral hospitals.

PRESENCE OF MALIGNANCY

In our study 5 patient's (4%) had malignancy. 3 were cases of colonic malignancy with perforation and 2 were of carcinoma stomach with perforation.

In a study by Rodolf L 2 patients had malignancy.

In a study by M.M Correia⁹ 89 patients with cancer were studied. Among them 8 were preoperative and all other were postoperative. Chronic use of NSAIDs in patients of malignancies exposes them to an increased risk of perforation.

ORIGIN OF SEPSIS

In our study 15 patients i.e. 13% had colonic origin of sepsis while in the rest 106 patients the origin of sepsis was non colonic.

In the study by Rodolf L 12.64% of patient's had colonic origin of sepsis.

In the study by Rajender Singh Jhobta 3.76% of patient's had colonic origin of sepsis.

The various causes of the perforation of the colon are trauma, diverticular perforation, perforated malignancy and mesenteric ischemia.

Colonic perforation presents with Feculent exudates and a severe form of peritonitis.

OUTCOME

Among the 121 patients studied by us 21 patients died thus placing the mortality at 17%.

Atsushi Hourichi in their study of perforation peritonitis had a mortality of 23.1%.

Koperna T¹⁰ et al in their study of secondary bacterial peritonitis had an average total mortality rate of 18.5%.

The mortality rate in various studies on perforation peritonitis ranges between 20-30%. Thus in spite of improvement in the medical management, availability of new broad spectrum antibiotics and vast development in the field of intensive care with easy availability of intensive care and life support measure the mortality from perforation peritonitis remains high.

Development of organ failure and sepsis are important determinants of mortality.

Therefore research and development should be directed in the understanding of pathogenesis and evolution of these factors so that new and more effective treatment strategies could be evolved.

Delay in the presentation for appropriate treatment should be addressed by means of strengthening the referral services and improving the means of transportation **CORRELATION BETWEEN AGE AND**

MORTALITY

In our study none of the patients below 15 years died, 1 patient died in age group 16 to 30 yrs with 7% mortality, 5 patients died in age group 31 to 45 yrs with 13% mortality, 8 patients died in age group 46-60 yrs with 18.6 % mortality, and 7 patients died in age group >60yrs with 39% mortality.

In a study by Rodolfo L Braco² the mean age of the survivors was 32.7 yrs (SD±16.64), among on-survivors mean age was 63 yrs (SD±18.94).

Pacelli F et al confirm age as a decisive factor related with mortality. They showed that patients with age of less than 70 yrs had a mortality rate of 17.2% compared to mortality rate of 37.7% in patients with age more than 70 yrs. Ali Yaghoobi Notash⁷ et al confirms that the risk of in hospital death was higher in patients aged above 60 yrs. Kusumoto Yoshiko¹¹ et al in their study of patients operated on for intra abdominal infection found that there was no mortality in less than 50 yrs age group, while mortality occurring only in patients older than 50 yrs.

Cecilie Svanes et al in their study found that among 581 patients with age <49, 18 patients died i.e. a mortality of 3.09%, while in patients with age >49 yrs the mortality was 11.94%.

Death and other outcomes of acute surgical illness are uniformly worse in the elderly than in young patients and the adverse impact of age on outcome from abdominal sepsis in particular is well recognized. The higher death rate among the elderly undoubtedly reflects an increased prevalence of pre existing cardiovascular and other diseases as well as a predictable decline in many physiological functions.

As patients get older coincident disease are more common. Even if there is no evidence of disease there may be a decrease in the physiology reserve such as the decrease in the glomerular filtration rate despite a normal creatinine. The initial disease that requires surgery may be complicated by tissue hypo perfusion and acidosis from vomiting and loss of fluid into the gastrointestinal tract or bleeding in the elderly population.

In our study we confirm that patients over 60 yrs undergoing emergency surgery for laparotomy have a higher risk of mortality. Mortality after surgery undoubtedly increases with age but this could be because of increases prevalence of comorbid medical conditions in the elderly.

CORRELATION BETWEEN SEX AND MORTALITY

In our study total of 88 patients belong to the male sex among which 14 died resulting in a mortality of 16%. Similarly, 33 patients belong to female sex among which 7 died with a mortality of 21% with slightly higher mortality accounted to higher number of females in advanced age. TM Cook et al found out in their study female sex is one of the parameter associated with death with an odds ratio of 0.21. Yoshiko Kusumoto et al found out in their study of 108 patients operated for intra-abdominal infections the mortality was 5.3% in men and 15.2% in women. In a study by MM Correia⁹ the factor of female sex has not reached statistical significance between the groups, but it showed a good performance (accuracy of 69.7%) when all MPI components were considered together.

CORRELATION BETWEEN ORGAN FAILURE AND MORTALITY

In our study a total of 34 patients showed evidence of organ failure. 16 patients died among this 34 patients thus resulting in a mortality rate of 47%, but contributing 76% of overall mortality. In the study by Rodolfo L² et al 11 (6.32%) patient's died and all of them presented with the variable of organ failure. Daniel A et al in their study found that the crude relative risk of death in patients with systemic sepsis was 13 times greater than those without. Severe sepsis was present in 424 patients (62%) among the 628 decedents. The author concludes that severe sepsis complicates the course of 11% of all patients with peritonitis. M Hynninen⁶ et al showed that the degree of organ dysfunction measured by the SOFA (sequential organ failure assessment) score was the best predictor for hospital mortality in patients suffering from secondary peritonitis. A systemic inflammatory response included by the peritoneal infection may further progress to septic shock and multi organ failure.

Organ failure is not an all or none phenomenon; rather it is a continuation of alteration in organ function from normal function, through varying degrees of dysfunction, to organ failure. The description of organ dysfunction needs to be based on simple, easily repeatable variables specific to the organ in question and readily available. Organ dysfunction is not static and it will alter over time.

These result mentioned above highlight the importance of early recognition, prevention and treatment of organ dysfunction in our attempt to improve the short and long term outcome in patients with peritonitis.

CORRELATION BETWEEN PREOPERATIVE DURATION OF PERITONITIS AND MORTALITY

In our study out of the 59 patients with a preoperative duration of peritonitis of less than 24 hrs no patients died. Out of the 62 patients who have preoperative duration of peritonitis of more than 24 hrs, 21 patients died thus placing the mortality rate of 34%. Ali Yaghoobi Notash⁷ found mortality of 11.4% in patients presenting within 24 hrs of the onset of symptoms while the mortality was 25% in patients presenting late. In the study by Rodolfo L² all the patients who died were having a preoperative duration of greater than 24 hrs. In the natural history of perforation peritonitis there is a gradual evolution from sepsis to resuscitation, empirical broad spectrum antibiotics and surgical intervention for the clearance of septic debris and control of the source of infection are key in the management of perforation peritonitis.

Scapellato S et al suggests that intervention time may be considered the main determinant of mortality in patients with peritonitis since intervention time is a modifiable prognostic factor while many other factors are not. Therefore in cases of peritonitis after the initial resuscitation of the patient's immediate laparotomy should be done as a surgical emergency.

Most of patients in our study had delayed presentation because of patient negligence, lack of transport facilities, and lack of adequate infrastructure and expertise in their place. Hence patient education, good transport facilities with good infrastructure and experts in peripheral centres may reduce mortality.

Intensive care units should be developed in subcentres and primary health centres with well trained professionals.

CORRELATION BETWEEN MALIGNANCY AND OUTCOME

In our study 5 patients had malignancy. 2 out of the 5 patients expired thus placing the mortality rate in presence of malignancy to 40%. Malignant bowel perforation is a frequent complication in patients with advanced cancer. Palliative surgery – the only treatment able to restore digestive transit must always be considered, but it should not be routinely performed. The decision making process is difficult, especially in advanced phases of cancer and depends on the level of perforation, the presence of single or multiple perforations levels, the extent of the cancer, associated comorbidities, and the performance status of the patient. When surgical or minimally invasive surgical approaches are not possible, a devastating clinical picture develops, which leads to intense symptoms, rapid deterioration of the patient's general status, and a short life expectancy.

Chao-Wen-Hsu⁸ in their study of colorectal perforations found out that although the overall mortality was 36.9% the highest disease specific mortality was due to malignancy (61.5%).

Peritonitis in oncological patients is generally caused by a ruptured viscus. The classic clinical manifestations are fever, abdominal pain, nausea, vomiting, diffuse abdominal tenderness, rebound tenderness and paralytic ileus. The diagnosis may be delayed by recent postoperative status, immunodepression, concomitant use of antibiotics and advancing age. □ Peritonitis in oncologic patients presents high mortality rates, essentially related to the severity of the underlying disease. □ These patients are less prone to survive serious infections.

Many disturbances of the immune system have been identified in oncologic patients, such as destruction of the anatomic barriers and derangement in the phagocytic activities and humoral and cellular responses. A consumption of opsonins may occur in the course of severe infection leading to failure of the immune system.

An aggressive surveillance programmes are necessary to decrease incidence of malignant perforation Education of people regarding lifestyle modification to decrease risk of various malignancies is key to eliminate this type of perforation.

CORRELATION BETWEEN ORIGIN OF SEPSIS (COLONIC/NON COLONIC) AND MORTALITY

In our study 10 patients had colonic origin of sepsis out of which 6 patients died resulting in a mortality of 60% while in non colonic origin of sepsis the mortality rate in our study was 13%. Perforations of large bowel are rare but severe complications, mainly of colorectal cancer and colonic diverticulitis

Thus according to our study colonic origin of sepsis is associated with poorer prognosis (increased mortality) than the non colonic origin of sepsis.

John Bohnen¹³ et al in their study of 176 patients found mortality of 10% in appendicitis and duodenal perforation, 50% in peritonitis of intra peritonitis origin other than appendix and the duodenal and 60% in postoperative peritonitis. Thus in this study the significance of the septic focus was highlighted and it showed that colonic perforation is a higher risk while appendicular and duodenal perforations had a good recovery rate. Chao-Wen-Hsu et al⁸ in their study of 141 patients with colorectal perforations found a mortality of 36.9%.

Most of colonic perforations occur in old age and debilitated patients.intense monitoring and care should be provided to these patients, as this group constitutes highest mortality. Reproducible scoring system that allow a surgeon to determine the severity of intra-abdominal infections are essential to rectify the effectiveness of different treatment regimens, to scientifically compare surgical intensive care units, to select a more aggressive surgical approach for high risk patients and to able to inform patient's relatives with greater objectivity. The results of treatment differ for peritonitis is especially difficult to evaluate because these patients may correspond to various etiologies, treatment differ and there is a lack of universally valid criteria and definitions. Identifying both prognostic factors and severity scales that provide objective description of the patient condition specific points such as the preoperative and postoperative periods is useful to improve our understanding of the problem involved.

Various scoring systems have been used to indicate prognosis of patients with peritonitis. These scores can be broadly divided into two groups:

Disease independent scores for evaluation of serious patients:

- APACHE II score
- Simplified acute physiology score (SAPS II)
- Sepsis severity score
- multiple organ dysfunction score

Peritonitis specific score:

- Mannheim peritonitis score (MPI)
- Peritonitis index Altona II
- Left colonic perforation score.

MANNHEIM PERITONITIS INDEX

It was developed by **wacha and linder**¹⁴ in 1983.

It was developed based on the retrospective analysis of data from 1253 patients with peritonitis in which 20 possible risk factors were considered. Of these 20 factors, only 8 were proven to be prognostic relevance and were entered into **MANNHEIM PERITONITIS INDEX**. These factors were classified according to their predictive power.

MANNHEIM PERITONITIS INDEX SCORE

Study variable	Adverse factor	Points	Favorable factor	Points
1. Age	>50 yrs	5	< 50 yrs	0
2. Sex	Female	5	Male	0
3. Organ failure	Present	7	Absent	0
4. Malignancy	Present	4	Absent	0
5. Evolution time	>24 hrs	4	<24 hrs	0
6. Origin of sepsis	Non-colonic	4	Colonic	0
7. Extension of peritonitis	Generalized	6	Localized	0
8. Character of exudates	Purulent	6	Clear	0
	Fecal	12		

Maximum possible score is 47 and minimal score is zero. Patients were divided in three categories according to **MPI** score:

1. Score less than equal to 21
2. Score between 21 to 29
3. Score equal to greater than 29

The MPI appears to be more practical than other scoring system, such as the APACHE II, which is time consuming and may be impossible to apply in the setting on intra abdominal sepsis. Also in a multicentre study of 2003 patients, the MPI had an acceptable specificity and sensitivity.

Much has been said and published about peritonitis but a consolidated analytical study of peritonitis and peritonitis grading scale is not found. The secondary peritonitis being a common problem with a high mortality and morbidity rate made us interested in conducting the study. Gastric and duodenal perforations have been included in the present study. Most parameters of this study correlated with manheims peritonitis index.

VIII. Conclusions And Summary

“STUDY ON FACTORS EFFECTING OUTCOME OF ABDOMINAL EMERGENCIES PRESENTING WITH PERITONITIS” was carried out in tertiary care teaching hospital during the study period from august 2014 to july 2016.

1. Total of 121 patients were studied.
2. All the 121 patients were cases of peritonitis diagnosed at laparotomy.
3. The age range was from 8 years to 87 yrs.
4. The mean age of the study population was 45 yrs..
5. In our study the incidence of male sex was 73% while that of female sex was 27%. Thus there was a male predominance with a male female ratio of 2.7:1.
6. Maximum numbers of perforations were seen in the duodenum which accounts for 56%, followed by appendicular perforation 11%.
7. The commonest presenting symptom was abdominal pain seen in 100% of patients.
8. Most of the cases were managed by the omental patch repair.
9. Of the 121 patients, 21 patients died (overall mortality 17.3%).
10. In males the mortality was 16% while in the female the mortality was 21%.
11. 34 patients had evidence of organ failure out of which 16 patients died thus the mortality in presence of organ failure was 47%.
12. 59 patients had a preoperative duration of less than 24 hrs. Among this no patient died, resulting in a mortality of zero. Out of 62 patients with a pre-operative duration of greater than 24hr, 21 died thus resulting in mortality 34%.
13. In 5 patients there was presence of malignancy of which 2 patients died. The mortality in the presence of the malignancy was 40%.
14. 10 patients had colonic origin of sepsis and in the remaining 111 patients, the origin of sepsis was non colonic. The mortality in the colonic origin of sepsis was 60% while in the non-colonic origin of sepsis the mortality was 13%.

Hence elderly age, female sex, presence of organ failure, pre operative duration more than 24 hours, presence of malignancy and colonic origin of sepsis are recognised as high risk factors. Presence of these factors should be identified, and patients should be categorised as high risk and should be provided intensive care.

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