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Original Research Article

Clinico-bacteriological profile of non-traumatic perforation peritonitis cases attending a tertiary care hospital of central India region

Sunita Meshram[1]*, Manoj Lal[2]

[1]Department of Surgery, Late Baliram Kashyap Memorial Medical College and Hospital Dimrapal, Jagdalpur, Chhattisgarh, India
[2]Department of Surgery, NMDC Hospital, Bacheli, Kirandul, Dist. Bastar, Chhattisgarh, India

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***Correspondence:**
Dr. Sunita Meshram,
E-mail: avinashmeshram09@gmail.com

ABSTRACT

Background: Peptic ulcer, typhoid and appendicitis constitute the common causes of non-traumatic perforation, tuberculosis, ascariasis, amoebiasis and roundworm infestation are less common. An increasing incidence of perforation of gastrointestinal tract provoked us to study various aspects of non-traumatic perforation of gastrointestinal tract.
Methods: The present study was carried out in 165 patients of non-traumatic gastrointestinal perforation, admitted in the surgical wards of sanjay Gandhi Memorial Hospital associated with S. S. Medical College, Rewa (M.P.), India, in the period from August 2002 to July 2003. All medical and surgical management was done, and necessary investigations were performed. A careful record of pre, per and postoperative findings were made in each in the proforma. All the cases were advised to attend surgical outpatient Department regularly for follow up.
Results: Maximum number of cases were due to peptic perforation 70.91% followed by typhoid perforations 26.06% and appendicular perforations 3.03%. Highest incidence of peptic perforation was recorded in the age group of 41-60 years (42.74%), typhoid perforation in age group of 21-40 years (42.74%), typhoid perforation in age group of 21-40 and 41-60 years of age group (40%). Pain abdomen was present in all cases of perforations Next common symptoms in peptic perforations was constipation and distension (90.5%). In typhoid perforations distension constipation (93.03%) followed by abdominal distension (83.72%) and in appendicular distension (80.0%) followed by abdominal distension (40.0%) cases. 51.2%cases of peptic perforation were operated, 58.1% typhoid perforations were operated and 100% cases of appendicular perforation were operated.
Conclusions: It is concluded from the study that non-traumatic gastrointestinal perforation is a common emergency surgical problem encountered by a general surgeon. The need for an early and accurate management is necessary, because if not treated timely the result will be fatal.

Keywords: Acute abdomen, Non-traumatic gastrointestinal perforation, Peptic perforation, Typhoid perforations

INTRODUCTION

Acute abdomen has been recognized since the era or Hippocrates. In past variety of terms were given to acute abdominal problems, among which common were iliac passion and illiacus. Illiac passion which can be considered synonym with acute abdomen was recognized by Paracelsus and sydenhan.

Break up of these cases will reveal that non-traumatic peroration of gastrointestinal tract is common abdominal emergency, which need early and efficient management to prevent fatal outcome.

Peritonitis resulting from non-traumatic perforation is one of the most common surgical emergencies faced by general surgeon.[1]

The leak from perforation at first may produce chemical peritonitis during 1st 6-8 hours later a septic follows due to secondary bacterial invasion. Septic contamination produces exotoxin and endotoxin as a result of cell breakdown this ultimately produces septic shock. Peritonitis which resultant septicemia, circulatory failure, renal pulmonary and other complications is associated with high morbidity and mortality.

The aetiology of non-traumatic gastro-intestinal perforation varies in different population of the world. Peptic ulcer, typhoid and appendicitis constitute the common causes of non-traumatic perforation, tuberculosis, ascariasis, amoebiasis and roundworm infestation are less common.[2,3]

Though the incidence of peptic ulcer disease has declined during last three decades due to over enthusiastic use of H_2 receptor antagonists and proton-pump inhibitors, the incidence of peptic perforations has not decreased, rather it has increased Over the past 25 to 50 years the demographics of patients who developed perforated peptic ulcer has changed whereas previously these patients were typically young and middle aged men with a history of peptic ulcer disease, they now tend to be elderly and chronically ill patients who are often taking one or more ulcerogenic medication specially NASAIDS.[4]

Typhoid perforation though a worldwide problem common in underdeveloped and developing countries, due to poor sanitation and hygiene its incidence varies from 1 to 20.5% of typhoid patients. Despite best possible management typhoid perforation perforation has high mortality and morbidity due to toxemia. The mortality in different Indian population varies from 11.5 to 34.5% (Mahendra).

Appendicular perforation is less common than that of peptic and typhoid it may present as Appendicular abscess of generalized peritonitis Though no age is exception, it is common in pre-school age group (frank Lansden) Tanga et al stated that incidence of Appendicular perforation is directly proportional to duration of symptoms.[5,6]

The management of gastrointestinal perforation is no longer a topic of controversy as it was in the past where the discussion was based on overall outcome of surgical intervention and conservative management surgical intervention is the choice, though conservative treatment is advocated in patients unfit for surgery. Despite advances in diagnosis, surgery, antimicrobial therapy and intensive care support, severe secondary peritonitis due to gastrointestinal perforation remains a potentially fatal affliction.[7]An increasing incidence of perforation of gastrointestinal tract provoked us to study various aspects of non-traumatic perforation of gastrointestinal tract.[8-10]

With the above background, the present study was conducted to assess the clinico bacteriological profile of non-traumatic perforation peritonitis cases.

METHODS

The present study was carried out in 165 patients of non-traumatic gastrointestinal perforation, admitted in the surgical wards of sanjay Gandhi Memorial Hospital associated with S.S.Medical College, Rewa (m.p.), India, in the period from August 2002 to July 2003. On admission of the case perforation peritonitis was suspected on clinical grounds. A detailed history was obtained from the patient and his attendants.

A thorough general examination was carried out in each case, with special attention to pulse, respiration, temperature, blood pressure, degree of dehydration and pallor. A careful and detailed examination of abdomen was carried out with special reference to distension of abdomen, tenderness, guarding, abdominal girth, pressure of free fluids in the peritoneal cavity, obliteration of liver dullness, rebound tenderness and bowel sounds. Per rectal examination was done to find out any evidence of pelvic abscess e.g. bulging of anterior rectal wall, bogginess or tenderness.

Pervaginal examination in relevant female patients was carried out to detect collection of fluid in the pouch of Douglas. All other systems of the body were examined for the purpose of anesthesia and to exclude any concomitant disease. All patients were resuscitated by IV fluids and blood if required Gastric decompression was done by putting Ryle's tube and antibiotics, analgesic and H2 receptor antagonist started.

Three group of antibiotics were used-

- Group A: ciprofloxacin + Metronidazole
- Group B: Ampicillin + Gentamicin
- Group C: Ceftriaxone/Cefotaxime+Metronidzole + Gentamicin

Patients who had low urine output inadequate renal function so the nephrotoxic drug Gentamicim was not used. All medical and surgical management was done, and necessary investigations were performed. A careful record of pre, per and postoperative findings were made in each in the proforma. All the cases were advised to attend surgical outpatient Department regularly for follow up. Data was compiled in MS-Excel.

RESULTS

It is evident from the Table 1 that maximum number of cases were due to peptic perforation 70.91% followed by typhoid perforations 26.06% and appendicular perforations 3.03% (Table 1).

Table 1: Distribution of cases according to etiological factors.

Aetiological factors	No. of cases	Percentage
Peptic perforation	117	70.91
Typhoid perforations	43	26.06
Appendicular perforation	5	3.03
Total	165	100.00

Table 2: Distribution of cases according to age group.

Age group (yrs)	Peptic		Typhoid		Appendicular	
	No	%	No	%	No	%
0-20	9	7.69	12	27.91	1	20.00
21-40	39	33.33	20	46.51	2	40.00
41-60	50	42.74	6	13.95	2	40.00
>60	19	16.24	5	11.63	-	-
Total	117	100.0	43	100.0	5	100.00

It is evident from the Table 2 that highest incidence of peptic perforation was recorded in the age group of 41-60 years (42.74%), and 41-60 years of age group (40%). Next common age affected were 21-40 years in peptic perforation (33.33%) and under 20 years in typhoid perforation (27.91%) (Table 2).

Table 3: Sex wise distribution of cases.

Disease	Male		Female	
	No.	%	No.	%
Peptic	98	83.76	19	16.23
Typhoid	38	88.37	5	11.62
Appendicular	3	60.0	2	40.0
Total	139	84.24	26	15.75

It is evident from the Table 3 that males were predominantly affected Peptic perforation was recorded 83.76% in male and 16.23% in females; typhoid perforation was found more in male (88.37%) than female (11.62%) appendicular perforation was more in male (60.0%) than female (40.0%) (Table 3).

Table 4: Distribution of cases according to residence.

Disease	Rural		Urban	
	No.	%	No.	%
Peptic	95	81.19	22	18.80
Typhoid	38	88.37	5	11.62
Appendicular	2	40.0	3	60.0
Total	135	81.81	30	18.18

It is evident from the Table 4 that perforations were more common in rural populations (Table 4).

It is evident from the Table 5 that incidence of peptic perforation and typhoid perforatios was highest in lower socioeconomic status (79.48% and 79.06%) appendicular perforation is equally distributed among middle and upper socioeconomic status (Table 5).

Table 5: Distribution of cases according to socioecomic status.

Occupation	Peptic		Typhoid		Appendicular	
	No	%	No	%	No	%
Lower	93	79.48	34	79.06	1	20.0
Middle	14	11.96	8	18.60	2	40.0
Upper	10	8.54	1	2.32	2	40.0
Total	117	100.0	43	100.0	5	100.0

Table 6: Presenting complains in cases.

Complains	Peptic		Typhoid		Appendicular	
	No	%	No.	%	No	%
Pain abdomen	117	100	43	100	5	100.0
Distension abdominal	106	90.5	36	83.72	2	40.0
Vomiting	7	5.9	4	9.30	-	-
Constipation	106	90.5	40	93.03	4	80.0
Fever	22	18.8	32	74.40	1	20.0

It is evident from the Table 6 that pain abdomen was present in all cases of perforations. Next common symptoms in peptic perforations was constipation and distension (90.5%);

In typhoid perforations distension constipation (93.03%) followed by abdominal distension (83.72%) and in appendicular distension (80.0%) followed by abdominal distension (40.0%) cases (Table 6).

Table 7: Radiological investigation (plain X-ray abdomen).

Findings	Peptic		Typhoid		Appendicular	
	No.	%	No.	%	No.	%
Ground glass opacity	10	8.54	3	6.9	1	20.0
Gas under diaphragm	85	72.6	24	55.8	1	20.0
Gas under diaphragm + fluid level	15	12.8	13	33.0	1	20.0
Fluid level + distended loop of Intestines	4	3.4	1	2.3	2	40.0
No gas or fluid level only haziness	3	2.5	2	4.6	-	-

It is evident from the Table 7 that scout film of abdomen in standing position showing both domes of diaphragm was taken in 165 cases (Table 7).

Purulent peritoneal fluid was observed in majority of cases in all groups. *E. Coli* and Kl.

Table 8: Physical appearance of peritoneal fluids.

Appearance	Peptic		Typhoid		Appendicular	
	No.	%	No.	%	No	%
Purulent	68	58.11	22	51.16	3	60.0
Serous	25	21.36	2	1.7	-	-
Serosanguinous	10	8.54	-	-	-	-
Bilious	4	3.4	15	34.88	-	-
Purulent bile Stained	5	4.27	2	4.6	2	40.0
Faeculent	5	4.27	2	4.6	-	-

Table 9: Culture pattern of peritoneal fluids.

Appearance	Peptic		Typhoid		Appendicular	
	No.	%	No.	%	No.	%
E. coli	67	57.26	26	60.46	3	60.0
K. aeruginosa	20	17.09	8	18.60	2	40.0
P. aeruginosa	2	1.7	-	-	-	-
Streptokinase viridans	8	6.8	1	2.32	-	-
Staph. aureus	6	5.12	1	2.32	-	-
Streptokinase pyocyaneus	2	1.70	-	-	-	-
Sterile	12	10.25	7	16.2	-	-

Table 10: Mode of treatment.

Mode of Treatment	Peptic		Typhoid		Appendicular	
	No.	%	No.	%	No.	%
Operative	60	51.2	25	58.1	5	100
peritoneal drain	15	12.8	6	13.9	-	
Consevative	42	35.9	12	27.9	-	

Aeruginosa were the predominent organisms found in culture of peritoneal fluids from all 3 group. 51.2% cases of peptic perforation were operated, 58.1% typhoid perforations were operated and 100% cases of appendicular perforation were operated (Table 8-10).

In peptic perforation mortality was maximum (55.5%) in 0-20 years of age group. In typhoid perforation mortality was maximum in 41-60 years. In appendicular perforation one died which was 21-40 years age group (Table 11).

Table 11: Mortality in relation to age.

Age Group (Yrs.)	Peptic			Typhoid			Appendicular		
	No.	Ex	%	No.	Ex	%	No.	Ex	%
< 20	9	5	55.5	12	3	25.0	1	-	-
21-40	39	14	35.8	20	7	35.0	2	1	50.0
41-60	50	16	32.0	6	3	50.0	2	-	-
>60	19	19	47.3	5	2	40.0	-	-	-
	117	44	37.6	43	15	34.8	5	1	20.2

DISCUSSION

Peritonitis resulting from perforation of GIT still carries formidable mortality in spite of the availability of newer antibiotics, better operative techniques, anesthesia and understanding in the maintenance of proper fluid and electrolyte balance before, during and after operation.

In the present series, peptic perforation was the commonest cause of perforation peritonitis (70.91%).

Typhoid perforation formed the next major group in the present series being responsible for 26.6% of cases. This is much higher than Budhraja et al and slightly less than Pal DK et al.[11,12] Due to improvement in health care, water supply system and personal hygiene. Infectious disease lie typhoid has much declined in the west. In India it remains a problem in rural area with low socio-economic group. Poor personal hygiene predisposes these people to typhoid fever, which being treated improperly by quacks in the villages leads to perforation. Practice of massaging the abdomen in many abdominal pains adds to the problem

The incidence of appendicular perforation (3.03%). Lower incidence can be attributed to lower incidence of appendicitis in the period in which the present study was carried out.

In the present series pain in abdomen was the presenting complaint in all cases. It was severe agonizing pain beginning in the epigastrium spreading to whole of the abdomen in majority. Followed by constipation and distension (90.5%) which is similar to Pal DK et al. Fever was present in 18.8% cases, which is similar to that of Pal DK et al.[12]

In the present series all the typhoid perforation cases were presented with pain in abdomen. It was severe in most of the cases, but in some cases due to toxemia the severity of pain could not be apprehended. The Next common symptom was constipation seen in 93.03% of cases. Which is similar to that reported by Pal and Singh RB but it is more than rest of all workers.[14,15] Distension of abdomen was seen in 83.72% cases in present series which is similar to that of Pal D.K. and Aman S.[12] observations are similar to Dickson and Cole.[13] Fever was found in 74.4% cases which are favored by that of Kumar A.[13]

Pain in abdomen was present in all cases of appendicular perforations in present series. In present series 85.47% cases of peptic perforation showed gas under diaphragm. This is less than that of Dev et al and bit more than rest of the workers.[14] In typhoid perforation gas under diaphragm was found in 86.04% cases. It is similar to that of Pal DK et al.[12]

Gas under diaphragm was found in 20% cases of appendicular perforation. This low percentage is because of the view that appendicular lumen is usually obliterated central to the perforation and visceral walling- off will tend to localize the process. Successful outcome in cases of gastrointestinal perforation is dependent on early diagnosis and prompt treatment. In present series 42 out of 117 cases (35.9%) of peptic perforation were treated conservative, 22 of them expired making mortality to 51.8%. Most of them had poor general condition on admission. Mortality in our series is more than Pal DK et al. Late admission with improper prior treatment accounts for the high mortality rate.[12]

In present series 12 out of 43 typhoid perforation cases (27.90%) were treated conservatively, six of them expired making mortality 50%. Our finding is similar to that of Aman S; more than Pande C, and less than rest of the series.[12,15] In present series no patient of appendicular perforation were treated conservatively.

In present series 60 out of 117 cases (36.66%) underwent exploratory laparatomy among peptic perforation cases. It includes 5 cases that were treated initially by peritoneal drainage under local anesthesia. In 48 cases (80%) simple closure in one layer with omentopaxy was done. In 11 cases (18.3%) simple closure without omentopaxy was done, 10 (20.83%) patients expired in cases of simple closure + omentopaxy, there was no death in gastrojejunostomy. In (4) (36.36%) patients simple closure was done, who were expired. There was no death in gastrojejunostomy. Mortality in present series was 36.66% which is more than to that of all the workers.

In present series 22 cases (51.16) of typhoid perforation underwent exploratory laparotomy. It includes 4 cases that were treated initially by peritoneal drainage under local anaesthesia. In all cases perforation were in terminal ileum. In 19 cases (76%) perforations were single, in 3 (12%) it was multiple. All perforations were present over antimesenteric border. In 19 cases (86.4%) simple closure of perforation after freshening of the edge was done in two layers, in three case (13.6%) simple closure with ileotransverse anastomosis was done. There was no mortality in simple closure with ileotransverse anastomosis while 5 patients in whom simple closure done, expired making mortality 26.2%. Toxemia, anemia and poor nutrition of the patient were the factors responsible for high mortality. Present study was supported by Singh A.[16]

In present series 5 cases (100%) of appendicular perforation underwent (exploratory) laparotomy of them one patient (20%) died. Present finding was supported by Stone et al, reported mortality of 14.28% and Marchildon and Dudgeon reported it to be 17%.[11,17,20]

In present study 58.11% of patients with non-traumatic gastrointestinal perforation had purulent peritoneal fluid on physical examination. This can be due to the fact that majority of cases reported late when secondary bacterial invasion of the fluid had occurred. In present study *E. coli* was the commonest organism isolated from the aspirated peritoneal fluid (58.1%). *K. aeruginosa* was the next common organism (18.18%). Culture was sterile in 11.5%.

In peptic perforation in the present study only 10.25% cultures were sterile. It can be attributed to the fact that majority of cases came late for admission. In peptic perforation majority of organism isolated. (57.2%) in present study were *E. coli*. It is much higher than those reported by Budhraja et al.[11]

De Bakey said that the presence or absence and incidence of positive culture in cases of peptic perforation will depend upon the length of time elapsing between the perforation and the performance of culture. The cultures are more likely to be positive, the greater to this period.[18]

The finding in the present study correlates with this view. In typhoid perforation causes again *E. coli* was the most common organism isolated (60.46%). It is more than the figure reported by Tripathi et al but much lower compared with Egglestone and Santoshi.[12,19]

In the present study peritoneal fluid from 4 of the 5 appendicular perforation cases could be cultured. In 3 cases (60.0%) *E. coli* was isolated. In two cases Klebsiella was the organism isolated the findings is very much similar with Marchildon et al so far as *E. coli* is concerned.[20]

The culture of peritoneal fluid form present study showed vast predominance of Gram negative bacilli which helped to selected the antibiotics effective against these bacilli.

CONCLUSION

It is concluded from present study that non-traumatic gastrointestinal perforation is a common emergency surgical problem encountered by a general surgeon. The need for an early and accurate management is necessary, because if not treated timely the result will be fatal. Operation is the treatment of choice should be done as early as possible after proper resuscitation if the general condition of patient permits.

Delay will make them unable to tolerate added stress of general anaesthesia and operation. Mortality in operative mode of treatment is least as compared to other modes. E. coli was the predominant isolated organism from peritoneal fluid and/or mostly sensitive to amino glycosides group of antibiotics.

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