CLINICOPATHOLOGICAL STUDY OF PERFORATION PERITONITIS IN PAEDIATRIC AGE GROUP IN MY HOSPITAL, INDORE- A PROSPECTIVE AND RETROSPECTIVE STUDY

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ABSTRACT

BACKGROUND

In acute abdomen, the difference between the best and worst surgery is infinitely less than between early and late surgery and the greatest sacrifice of all is sacrifice of time. The aim of the present work is to find out the epidemiology of the gastrointestinal perforation in children and incidence of aetiology in such perforations and the result of different surgical procedure and management performed.

MATERIALS AND METHODS

A prospective and retrospective study was conducted in Mahatma Gandhi Memorial Medical College and MY Hospital over a period of 5 years from Jan. 2013 to Oct. 2017. A total of 106 patients presented in this period with hollow viscus perforation and out of these 59 patients were retrospective and 47 were prospective. In our study, the main diagnostic tools were history, clinical examination, scout film abdomen and operative findings. The different GI perforations were labelled under the aetiologies as enteric, idiopathic, unknown, appendicular, tubercular and miscellaneous perforation.

RESULTS

A total of 106 patients with gastrointestinal perforation were included in the study. The causes for perforation were traumatic (19.23%), idiopathic (15.38%) and enteric (15.38%).

CONCLUSION

The common pathology of gastrointestinal perforation is traumatic, idiopathic and enteric fever. N. mortality is 29%. Hence, the need of the day is correct recognition at the earliest opportunity of the case of perforation peritonitis, an extensive medical management and timely judgement for surgical intervention.

KEY WORDS

Gastrointestinal Perforation, Aetiology, Surgical Intervention.

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BACKGROUND

Perforation peritonitis^{1,2,3,4} continues to be a significant health problem. It represents a major cause of morbidity and mortality, prolonged hospitalisation and health care problem. Perforation of gastrointestinal tract of the newborn child was first reported by Siebold in 1920. Such perforations are labelled as spontaneous perforation peritonitis. The diagnosis of perforation peritonitis in some way is difficult than adults. In a history taken is plain and unembroidered. There are still many features of genesis and natural history of perforation peritonitis that are incompletely understood. Cases of perforation peritonitis have very high mortality- about 40% and more so if treated conservatively. The high mortality²⁰ and morbidity rates can be attributed to delay in seeking medical attention, failure by clinician to diagnose the disease early and accurately, insufficient pre-operative resuscitation and poor management.

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Hence, the need of the day is correct recognition at the earliest opportunity of the cases of perforation peritonitis, an intensive medical management and timely judgement for surgical intervention. Unfortunately, it is not easy and the attending surgeon finds himself in a dilemma and the diagnosis depends upon help from detailed history, clinical, laboratory and skiagraphic examination and their interpretation. Taking into consideration the importance of this subject and its associated complications, present study has been undertaken.

Aims and Objectives

1. Study of incidence and cause of perforation peritonitis in children.
2. To evaluate the results of various lines of treatment in perforation peritonitis in children.
3. To observe the clinical presentation of perforation peritonitis and their significance as an aid to diagnosis.
4. To find out the value of laboratory, radiographic and additional diagnostic procedures as an aid to diagnosis.

MATERIALS AND METHODS

The study is being conducted in MGM Medical College and MY Hospital, Indore as a prospective and retrospective study. Patients between 0 - 12 years of age are included in the study.

Sample Size- 106.

Study Design- Descriptive study.

Methods

For Retrospective Study- The old case files were taken from the Department of Surgery, MY Hospital, Indore from Jan. 2013 to Dec. 2015.

For Prospective Study

The records of admitted patients are taken from Jan. 2016 to Oct. 2017, paediatric surgery ward with gastrointestinal perforations examined, investigated and managed the following manner-

1. Particulars of the patient.
2. Recording of present complaints.
3. Past history in relation to fever, loss of weight, bowel habits, loose motions, worm infestation, any previous operation.
4. General examination of the patient to detect any signs of dehydration; a record of pulse, BP, respiration and temperature.
5. Systemic examination of the chest to rule out pneumonia or any other associated condition of lungs and heart.
6. Local examination of abdomen regarding distension, external injury, tenderness, guarding, rigidity, lump, fluid thrill, obliterated liver dullness and bowel sounds.
7. Rectal examination.
8. Investigations.
 - Routine examination of urine and blood.
 - Radiological examination- X-ray chest (PA view), scout film of abdomen.
 - Widal test.
 - Abdominal paracentesis.
 - Histopathological examination of the biopsy material taken from the resected part of the bowel, mesenteric nodes, omentum etc.

After confirmation of the diagnosis treatment is either conservative or operative if operative details of surgical procedures, follow-up of treated patients, records of complications, final outcome and comments.

Year	TRA	I/V	APP	ENTE	TB	UNK	MI	Total
2013	6	4	1	2	2	2	0	17
2014	9	1	4	3	3	1	0	21
2015	7	3	0	2	3	3	3	21
Total	22	8	5	7	8	6	3	59

Table 1. Distribution of Cases of GI Perforation of Various Aetiology, Retrospective Study

Year	TRA	I/V	APP	ENTE	TB	UNK	MI	Total
2016	5	4	2	4	3	4	4	26
2017	7	2	4	5	1	1	1	21
Total	12	6	6	9	4	5	5	47

Prospective Study

TRA- trauma, I/V- idiopathic virus, APP- appendicular, ENTE- Enteric, TB- Tuberculosis, UNK- Unknown, MIS- Miscellaneous. Maximum cases 26 GI Perforation in infants and children occurred in 2016. According to E/O 19.23% TRA, 15.38% are I/V, ENT, UNK and Misc., 11.53% TB and 7.69% APP recorded in this year.

Age	TRA	I/V	APP	ENTE	TB	UNK	MIS	Total
1D	-	1	-	-	-	1	-	2
1M	-	-	-	-	-	2	-	2
1Y	-	1	-	-	-	2	-	3
2Y	-	1	-	-	-	1	-	2
3Y	1	-	-	-	-	2	-	3
4Y	1	-	-	-	1	2	-	4
5Y	2	-	-	1	2	1	1	7
6Y	4	-	-	3	-	-	-	7
7Y	1	-	-	1	-	-	-	2
8Y	2	-	-	-	2	-	1	5
9Y	1	-	-	-	1	-	-	2
10Y	2	-	1	1	1	-	-	5
11Y	2	-	-	1	1	1	-	5
12Y	6	-	4	-	-	-	-	10
Total	22	3	5	7	8	12	2	59

Table 2. Depicts Aetiological Factors of Gastrointestinal Perforation in Relation to different Age Group, Retrospective Study

Maximum perforation occurred in age group 5 - 12 years taking all cases. The main aetiological factors in this age group are (traumatic^{5,6,7,8} 46.51%) followed by enteric⁹ (16.27%), tubercular 16.27%, appendicular (11.62%), unknown 4.65%.

Age	TRA	I/V	APP	ENTE	TB ¹⁰	UNK	MIS ¹¹	Total
1D	-	-	-	-	-	1	-	1
1M	-	4	-	-	-	4	4	12
1Y	-	2	1	-	-	-	-	3
2Y	-	-	-	-	-	-	-	-
3Y	1	-	-	-	-	-	-	1
4Y	-	-	-	-	-	-	-	-
5Y	1	-	-	-	-	-	-	1
6Y	1	-	-	1	-	-	-	2
7Y	2	-	1	-	1	-	-	4
8Y	1	-	2	-	-	-	-	3
9Y	-	-	-	1	-	-	-	1
10Y	1	-	1	3	1	-	1	7
11Y	1	-	1	2	-	-	-	4
12Y	4	-	-	2	2	-	-	8
Total	12	6	6	9	4	5	5	47

Table 3. Depicts Aetiological Factors of Gastrointestinal Perforation in Relation to different Age Group, Prospective Study

Prospective studies show that maximum GI perforations is seen in age group of 7 - 12 years including all cases. The aetiology in this age group is enteric perforation^{12,13} (29.62%) followed by appendicular (18.51%).

Type of Perforation	No. of Cases	Male		Female		M:F
		No.	%	No.	%	
TRA	22	11	50.0	11	50.0	1:1
I/V	3	2	66.66	1	33.33	2:1
APP	5	5	100.00	-	-	-
ENTE	7	4	57.14	3	42.86	1.33:1
TB	8	1	12.50	7	87.50	.142:1
UNK	12	6	50.00	6	50.00	1:1
MIS	2	-	-	2	100.00	-
Total	59	29	49.15	30	50.85	0.96:1

Table 4. Sex Distribution in different Aetiologies, Retrospective Study

Type of Perforation	No. of Cases	Male		Female		M:F
		No	%	No	%	
TRA	12	8	66.66	4	33.33	1.5:1
I/V	6	4	66.66	2	33.33	1.5:1
APP	6	3	50.00	3	50.00	1:1
ENTE	9	5	55.55	4	44.45	1.25:1
TB	4	1	25.00	3	75.00	0.33:1
UNK	5	3	60.00	2	40.00	1.50:1
MIS	5	4	80.00	1	20.00	4:1
Total	47	28	59.57	19	40.43	1.47:1

Table 5. Prospective Study

Retrospective study shows female preponderance ratio and prospective study shows male preponderance ratio.

Year	OES	Gastric	Jej	Ileum	App	Colon	GB	Mid Gut	Unknown	MIS	Total
2013	-	-	-	6	1	2	-	-	8	-	17
2014	-	-	-	11	4	1	-	-	4	1	21
2015	-	-	-	13	-	1	-	-	6	1	21
2016	-	-	2	11	1	5	-	-	6	1	26
2017	-	-	-	11	4	1	-	-	5	-	21
Total	-	-	2	52	10	10	-	-	29	3	106

Table 6. Annual Evidence and GI Perforations of various Sites, Retrospective and Prospective Study

Month	TRA	I/V	APP	ENT	TB	UNK	MIS	TOTAL
1-3	8	2	4	4	2	2	2	24
4-6	8	3	3	5	5	6	4	34
7-9	9	4	2	4	2	3	2	26
10-12	9	5	2	3	3	0	0	22
Total	34	14	11	16	12	11	8	106

Table 7. Seasonal Incidence of GI Perforation, Retrospective and Prospective Study

Maximum perforation in 2nd quarter of the year (32.07%) in the month of April and June followed by third and 1st quarters of year.

Type	Total	Pain	Fever	Disten.	Vomit	Constit.	Diarrhoea
TRA	22	22	1	17	8	4	-
I/V	8	1	2	8	8	6	-
APP	5	5	5	1	3	1	-
ENT	7	7	7	7	7	4	-
TB	8	8	8	8	7	8	-
UNK	3	3	-	3	1	-	-
MIS	6	3	4	6	6	3	-
Total	59	49	27	50	40	26	-

Table 8. Symptom in different Types of Perforation, Retrospective Study

Type	Total	Pain	Fever	Disten.	Vomit	Constit.	Diarrhoea
TRA	12	12	-	8	8	1	-
I/V	6	1	2	6	4	5	-
APP	6	6	3	6	6	6	-
ENT	9	8	7	9	8	9	-
TB	4	4	4	4	4	3	-
UNK	5	-	2	5	3	5	-
MIS	5	1	1	5	2	5	-
Total	47	32	19	43	35	34	-

Table 9. Prospective Study

Abdominal distention and pain are the main complaints of patients in GI perforation (84.74%) and (83.05%) followed by vomiting (67.79%), fever (45.76%) and constipation (44.06%) in retrospective study

In prospective study, abdominal distention and vomiting (91.48% and 74.46%) and pain (72.34%). In appendicular perforation, abdominal pain is the leading feature.

Type	Total	Tend.	Rigidity	Obl Liver Dullness	Bowel Sounds	
					P	A
TRA	22	22	10	3	15	7
I/V	8	4	8	4	-	8
APP	5	5	1	1	3	2

ENT	7	7	7	3	1	6
TB	8	8	7	2	3	5
UNK	6	5	5	2	1	5
MIS	3	3	3	1	2	1
Total	59	54	41	16	25	34

Table 10. Clinical Signs in different Types of Perforation, Retrospective Study

Type		Total	Tend.	Rigidity	Obl Liver Dullness		Bowel Sounds
					P	A	
TRA	12	12		9	3	2	10
I/V	6	1		5	-	-	6
APP	6	5		3	-	-	6
ENT	9	8		8	3	-	9
TB	4	4		3	1	1	3
UNK	5	-		3	-	-	5
MIS	5	1		1	-	-	5
Total	47	31		32	7	3	44

Table 11. Prospective Study

Abdominal tenderness and rigidity are the cordial sign of GI perforation (91.52% and 65.95%) and (69.49%, 68.08%).

Type	Total No. of Cases in which Test Performed	Widal Positive	Test Positive %
Enteric	7	5	71.42
	Prospective		
Enteric	9	6	66.66

Table 12. Showing Results of Widal Test in Case of Enteric Perforation

Retrospective Type	Total Cases	Simple Repair and Peritoneal Drainage	Appendicectomy	Resection and Anastomosis	Other	Conservative	Peritoneal Drainage
TRA	22	16	-	-	5	-	1
I/V	8	1	-	-	-	1	6
APP	5	-	2	--	-	-	3
ENT	7	5	-	-	-	-	3
TB	8	5	-	-	-	-	3
UNK	6	-	-	-	-	1	5
MIS	3	1	-	-	-	-	2
Total	59	28	2	-	5	2	22

Table 13. Different Modes of Treatment in different Types of GI Perforation, Retrospective Study

Type	Total Cases	Simple Repair and Peritoneal Drainage	Appendicectomy	Resection and Anastomosis	Other	Conservative	Peritoneal Drainage
TRA	12	11	-	1	-	-	-
I/V	6	3	-	1	-	-	2
APP	6	-	3	-	-	-	3
ENT	9	6	-	1	-	-	2
TB	4	3	-	-	-	-	1
UNK	5	2	-	-	-	2	1
MIS	5	4	-	-	-	-	1
Total	47	29	3	3	-	2	10

Table 14. Prospective Study

Retrospective study shows that operative management was the main modality of management. 47.45% cases managed by simple repair and peritoneal drainage, out of which peritoneal drainage was done in 37.28% of cases for general condition of the patient. The conservative management was undertaken in 3.38% cases.

A prospective study shows that operative management was undertaken in 70% of the cases, out of which simple repair and peritoneal drainage was done in 61.70 and 21.27% patients managed by peritoneal drainage. The conservative management was undertaken in 4.25% cases.

DISCUSSION

Perforation of Unknown Site and Aetiology

1. The aim of the present work was to find out the epidemiology of the gastrointestinal perforation in children and incidence of the aetiology in such perforation and the result of different surgical procedures and management performed at MY Hospital, Indore during 5 years.
2. **Enteric Perforation**
History of remittent fever > 2 weeks, positive Widal test, usually > 1 ileal perforation. Not any typical feature of any known aetiology.
3. **Idiopathic Perforation**

Irregular fever for < 2 weeks, single ileal perforation, negative Widal.

4. Appendicular Perforation

Perforated or gangrenous appendix with surrounding oedema.

5. Tubercular Perforation

History of pulmonary TB or gastrointestinal TB present and confirmed by HP examination of involved mesenteric LN.

6. Miscellaneous Perforations

Very rare site and incidence. There are Meckel's diverticulum, volvulus of gut, ileal atresia, vitelointestinal duct, colonic perforation etc.

7. Traumatic Perforations

History of blunt or penetrating trauma over abdomen.

Epidemiology of Gastrointestinal Perforation in Children

- Incidence of prevalence- 1.34% of all admissions.
- Age incidence- 58.49% in the age group of 5 - 12 years.
- 23.58% in the age group of 1 D - 2 years.
- Sex incidence- prospective: M: F= 0.96: 1, retrospective M: F=1.47: 1
- Traumatic perforation, M: F= 1.26: 1
- Appendicular 2.66: 1
- Enteric 1.28: 1
- Tubercular 0.2: 1
- Miscellaneous 1.33: 1
- Aetiology- Traumatic perforation 33.07%
- Enteric perforation, 15.09%
- Idiopathic perforation, 13.20%
- Appendicular and unknown 10.37% each
- Miscellaneous, 7.54%
- Site of perforation- usually the small gut followed by colon, duodenum, stomach are the commonest sites of perforation.

CONCLUSION

Maximum cases of GI perforation^{14,15,16} occurred in 2016 (19.31%) irrespective of the aetiology- Traumatic (19.23%) and Idiopathic (15.38%) and Enteric (15.38%) were the main aetiology. Miscellaneous and unknown site perforations (15.30%). Age incidence was max in 5 - 12 years; however, miscellaneous group neonates and infants were under 1 year of age in retrospective study and < 12 years of age in prospective study. Female preponderance in retrospective study (0.96:1) and male preponderance in prospective study (1.47:1). For clinical diagnosis, main symptoms were abdominal distention (84.74%) and pain (83.05%) and signs were generalised tenderness (91.52%) in retrospective study and rigidity (68.08%) in prospective study. Operative management was the main modality of treatment (47.45% and 61.70%). The site of perforation was ileum (49.05%). In general, mortality rate was 29%.

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