

**MANAGEMENT OF ILEAL PERFORATION USING APACHE – II SCORING: A PROSPECTIVE STUDY**Gaurav Agrawal<sup>1</sup>, Megha Mittal<sup>2</sup>, Amit Agrawal<sup>3</sup>, K. K. Agrawal<sup>4</sup><sup>1</sup>Consultant, Department of Surgical Oncology, BIMR Oncology Centre, Gwalior.<sup>2</sup>Assistant Professor, Department of Radiodiagnosis, GR Medical College, Gwalior.<sup>3</sup>Resident, Department of Radiotherapist, SRMS Hospital, Bareilly.<sup>4</sup>Consultant, Department of Oncology, BIMR Oncology Centre, Gwalior.**ABSTRACT****BACKGROUND**

Peritonitis resulting from small bowel perforation is a frequently encountered surgical problem in India. A review of literature indicates a very high mortality associated with this condition in spite of advances in treatment. The management of ileal perforation has been a subject of controversy. Operative treatment has been generally accepted as the treatment of choice, but the choice of procedure continues to be debated.

**AIMS AND OBJECTIVES**

In this we will study the patient factors responsible for poor outcome independent of or in association with APACHE II scoring. We will compare the outcomes of different methods of treatment.

**MATERIAL AND METHODS**

This is a prospective study of 60 patients of surgically verified ileal perforation treated in J. A. Group of Hospitals, Gwalior, during 1.08.2005 to 31.07.2006. The patients were categorised into three risk groups that is low risk, intermediate risk and high risk according to APACHE II scoring system. The low risk group were managed by surgery without faecal diversion (ileostomy). The intermediate risk were managed by surgery with faecal diversion (ileostomy). Since in high risk group patients could not undergo immediate laparotomy, they were managed medically first and then subjected to further management.

**RESULTS**

APACHE II score provides the extent of physiology derangement and preadmission chronic health of a patient with intra-abdominal sepsis. Thirty patients (50%) had score below 10 (low risk group). Simple closure of perforation was done in 24 patients and resection anastomosis was done in 6 patients. Twenty six patients had a score in between 11-20 (Intermediate risk group). In all of them, ileostomy with distal mucus fistula was made. All of them recovered satisfactorily. Four patients had a score of more than 20 (High risk group). In all of them, bilateral flank drainage was done under local anaesthesia. All of them died over a period of few days. Main postoperative complications were wound infection 43.3% and burst abdomen 23%. Biopsy of ileal segment was performed in 46 cases. Thirty cases (65.21%) showed acute enteritis, 12 cases (26.08%) showed chronic nonspecific inflammation and 4 cases (8.69%) showed epithelioid granuloma with caseation.

**CONCLUSION**

The present study emphasises the importance of severity scoring system like APACHE II in the management of critical illnesses like perforation peritonitis. We have followed the APACHE II in categorising the patients and managing them accordingly. The mortality rate of 6.6% is very low as compared to other studies. This signifies the importance of APACHE II scoring. We conclude that APACHE II should be included in guidelines for managing the perforation peritonitis cases.

**KEYWORDS**

Ileal Perforation, Ileostomy, APACHE II.

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**INTRODUCTION**

Peritonitis resulting from small bowel perforation is a frequently encountered surgical problem in India. A review of literature indicates a very high mortality associated with this condition in spite of advances in treatment.<sup>1</sup> Severity scoring is a valuable tool for assessing the severity of acute illness and thereby deciding the management strategy.

Acute Physiology and Chronic Health Evaluation (APACHE – II) system is the best available method of risk stratification in intra-abdominal infection.<sup>2</sup>

The high mortality rate in patients with ileal perforation appears to be a function of the disease process rather than the means of treatment. The management of ileal perforation has been a subject of controversy. Operative treatment has been generally accepted as the treatment of choice, but the choice of procedure continues to be debated.<sup>3</sup>

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**AIMS AND OBJECTIVES**

In this we will study the patient factors responsible for poor outcome, independent of or in association with APACHE II scoring. We will compare the outcomes of different methods of treatment.

## REVIEW OF LITERATURE

Our ability to extend and maintain life in the face of critical illness continues to improve as our diagnostic and therapeutic armamentarium becomes increasingly more advanced.

The reliable classification of the severity of illness is needed not only to predict prognosis, but also to evaluate and compare the results of different treatment regimens.

Currently, no ideal and generally accepted scoring system exists to determine the prognosis of peritonitis and intra-abdominal sepsis. In multivariate analysis, only the APACHE II score contributed independently to the prediction of outcome. APACHE II system has been validated in large independent patient population and it has been used in several studies.<sup>4,5,6</sup>

### Advantages of APACHE II Scoring

1. It is reliable and validated.
2. It is objective.
3. It is composed of information that is independent of diagnostic criteria.
4. It is composed of information that can be obtained prior to treatment and is therefore independent of treatment.
5. It has a large range of score with small increments, each of which contributes to the risk.
6. The score value can be translated into a mortality risk level.

Stratification by APACHE II score and distribution of risks depending on the number of patients in the study, they can be grouped into any number of strata by APACHE II score value. Smaller studies can be divided into 3 groups, forming low (0-10 points), intermediate (11-20) and high (21+) risk groups.

## MATERIAL AND METHODS

This is a prospective study of 60 patients of surgically verified ileal perforation treated in J.A. Group of Hospitals, Gwalior, during 1.08.2005 to 31.07.2006.

The patients were categorised into three risk groups that is low risk, intermediate risk and high risk according to APACHE II scoring system (Table 1).

The low risk group were managed by surgery without fecal diversion (ileostomy). The intermediate risks were managed by surgery with faecal diversion (ileostomy). Since in high risk group patients could not undergo immediate laparotomy, they were managed medically first and then subjected to further management.

## OBSERVATIONS

APACHE II score provides the extent of physiology derangement and preadmission chronic health of a patient with intra-abdominal sepsis. Thirty patients (50%) had score below 10 (low risk group). Simple closure of perforation was done in 24 patients and resection anastomosis was done in 6 patients. Twenty six patients had a score in between 11-20 (Intermediate risk group). In all of them ileostomy with distal mucus fistula was made. All of them recovered satisfactorily. Four patients had a score of more than 20 (High risk group). In all of them, bilateral flank drainage was done under local anaesthesia. All of them died over a period of few days.

In low risk group the decision to perform resection anastomosis was based on, if the patient had:

1. Multiple perforations.
2. Perforation involving more than half circumference of bowel.
3. Adjacent unhealthy segment of bowel.
4. Strictorous segment.

Main post-operative complications were wound infection 43.3% and burst abdomen 23%. Biopsy of ileal segment was performed in 46 cases. Thirty cases (65.21%) showed acute enteritis, 12 cases (26.08%) showed chronic nonspecific inflammation and 4 cases (8.69%) showed epithelioid granuloma with caseation.

## DISCUSSION

Most surgeons agree that the treatment of ileal perforation should be surgery, as this eliminates peritoneal soiling and endotoxaemia. There is, however, no uniformity of opinion as to the extent of surgery and several procedures ranging from simple closure of the perforation, wedge excision and anastomosis or segmental resection and anastomosis to ileostomy with mucus fistula.<sup>(7,8,9,10,11)</sup>

In the present study, different operative procedures were performed according to the severity of illness. Simple closure of perforation was done in 24 patients (40%) with APACHE II score of 0-10. These patients have single perforation with minimal peritoneal contamination. In 6 patient's resection and anastomosis was performed because of multiple perforations or single perforation involving more than half of bowel circumference or when the bowel was considered unhealthy for simple closure. Recovery was smooth in all these patients. In 26 patients with APACHE II score of 11-20, ileostomy with mucus fistula was made. All these patients recovered well. In 4 patients APACHE II score was more than 21, all of them died. All these results were comparable to other studies by Ourin,<sup>(7)</sup> Welch TP,<sup>(8)</sup> Kim JP,<sup>(9)</sup> Mulligan TO<sup>(10)</sup> and Gibney EJ.<sup>(11)</sup>

In present study, the aetiology was considered to be chronic inflammation and it was tuberculosis in 8.69%.

In a study by Nadkarni et al,<sup>(12)</sup> the cause of perforation was difficult to establish in 56.6% patients and they were termed nonspecific. They concluded that the prognosis directly relates to the degree of septicaemia, which depends on the resistance of organism, degree of peritoneal contamination and delay in manifestation. Patients with advanced septicaemia usually die in spite of any treatment given.

In the present study, the mortality rate was 6.6% as compared to 9.5% in a study by Singh KP et al,<sup>(13)</sup> 21.2% in a study by Eustache and Kreis<sup>(14)</sup> and 30% in a study by Eggleston and Santoshi.<sup>(15)</sup>

## CONCLUSION

The present study emphasises the importance of severity scoring system like APACHE II in the management of critical illnesses like perforation peritonitis. We have followed the APACHE II in categorising the patients and managing them accordingly. The mortality rate of 6.6% is very low as compared to other studies. This signifies the importance of APACHE II scoring. We conclude that APACHE II should be included in guidelines for managing the perforation peritonitis cases.

### The APACHE II Severity of Disease Classification System

Physiologic Variable	+4	+3	+2	+1	0	+1	+2	+3	+4
Temperature - rectal (°C)	≥41	39-40.9		38.5-38.9	36-38.4	34-35.9	32-33.9	30-31.9	≤29.9
Mean Arterial Pressure (mm Hg)	≥160	130-159	110-129		70-109		50-69		≤49
Heart Rate	≥180	140-179	110-139		70-109		55-69	40-54	≤39
Respiratory Rate (nonventilated or ventilated)	≥50	35-49		25-34	12-24	10-11	6-9		≤5
Oxygenation (mmHg) a. FiO <sub>2</sub> > 0.5 use A-aDO <sub>2</sub> b. FiO <sub>2</sub> < 0.5 use PaO <sub>2</sub>	a	≥500	350-499	200-349		<200			
	b					> 70	61-70		55-60
Arterial pH	≥7.7	7.6-7.69		7.5-7.59	7.33-7.49		7.25-7.32	7.15-7.24	<7.15
Serum Sodium (mmol/l)	≥180	160-179	155-159	150-154	130-149		120-129	111-119	≤110
Serum Potassium (mmol/l)	≥7	6-6.9		5.5-5.9	3.5-5.4	3-3.4	2.5-2.9		<2.5
Serum Creatinine (mg/dl, Double point score for acute renal failure)	≥3.5	2-3.4	1.5-1.9		0.6-1.4		<0.6		
Hematocrit (%)	≥60		50-59.9	46-49.9	30-45.9		20-29.9		<20
White Blood Count (in 1000/mm <sup>3</sup> )	≥40		20-39.9	15-19.9	3-14.9		1-2.9		<1
Glasgow-Coma-Scale (GCS)	Score = 15 minus actual GCS								
Serum HCO <sub>3</sub> (venous, mmol/l, use if no ABGs)	≥52	41-51.9		32-40.9	22-31.9		18-21.9	15-17.9	<15
<b>A = Total Acute Physiology Score APS</b>	Sum of the 12 individual variable points								
<b>B = Age Points</b>	<b>C = Chronic Health Points</b>								
≤44 years      0 points	If the patient has a history of severe organ system insufficiency or is immunocompromised assign points as follows: a. For nonoperative or emergency postoperative patients – 5 points b. For elective postoperative patients – 2 points								
45-54 years    2 points									
55-64 years    3 points									
65-74 years    5 points									
≥75 years      6 points									
<b>APACHE II Score = Sum of A (APS points) + B (Age points) + C (Chronic Health points)</b>									

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