

**Effectiveness of Mannheim Peritonitis Index in predicting the morbidity and mortality of patients with hollow viscus perforation (HVP) in tertiary health care centre.**

**Dr. Senthamizhan. S<sup>1</sup>, Dr. Suhas.N.Bhushan<sup>2</sup>, Dr. Tanmay<sup>3</sup>**

1-Senior Resident, 2- Assistant Professor, 3- Junior Resident

Department of General Surgery

The Oxford Medical College, Hospital and Research Centre, Bengaluru

**Correspondence : Dr. Suhas. N. Bhushan\***

**ABSTRACT**

**AIM:**

To study the efficacy of Mannheim's peritonitis index in predicting the outcome in a patient of peritonitis.

**OBJECTIVES:**

Evaluation of Mannheim Peritonitis Index (MPI) score for predicting the morbidity and mortality in patients with peritonitis due to hollow viscus perforation.

**MATERIALS AND METHODS:**

Prospective study of 53 patients operated for perforation peritonitis in Oxford Medical College, Bengaluru from October 2020 to August 2022. Mannheim Peritonitis Index score was calculated for each patient.

**RESULTS:**

Mean age group was  $35.19 \pm 12.77$ . Male predominant with 38 (71.7%) and female were 15 (28.3%) Duration of peritonitis was <24 hours in 25 (47.2%) cases and >24 hours in 28 (52.8%) cases. Peritonitis was localized in 8(15.1%) cases and diffuse in 45(84.9%) cases. Exudate was clear in 7 (13.2%) cases, cloudy and purulent in 43 (81.1%) cases and

fecal in 03 (5.7%) cases. MPI score was <21 in 36 (67.92%) cases, 21-29 in 06 (11.32%) cases and >29 in 11 (20.75%) cases.

Perforated appendix was 21 (39.62%), peptic ulcer perforation 17 (32.07%) and duodenal perforation was 09 (16.98%) were common causes of perforation peritonitis. Organ failure was present in 12 (22.6%) cases. Malignancy was present in 8 (15.1%) cases. Colonic origin of sepsis was in 16 (30.2%) cases. Mortality was in 5 (9.43%) cases out of which 3 (5.66%) were male and 2 (3.77%) were females.

Mannheim Peritonitis Index scores of  $\leq 20$ , 21-29, and  $\geq 30$  had a mortality of 0%, 0%, and 9.43% respectively. Presence of generalized peritonitis, organ failure at time of admission, type of intra peritoneal exudates carried more significance in predicting the mortality and morbidity in the post op period than other variables.

**CONCLUSION:**

Mannheim Peritonitis Index is a simple and specific scoring system for predicting the mortality in patients with secondary peritonitis. Increasing scores are associated with poorer prognosis, needs intensive management.

**KEY WORDS:**

Mannheim peritonitis index, Morbidity, Mortality, Perforation peritonitis, HVP - Hollow Viscous Perforation

## INTRODUCTION

Peritonitis denotes inflammation of the peritoneum from any cause. Peritonitis secondary to hollow viscus perforation is a common abdominal emergency faced by the general surgeons worldwide.<sup>1</sup> Despite advances in diagnosis, management and critical care, prognosis remains poor.<sup>2,3</sup>

Grading the severity of the peritonitis improves the management of severely ill patients. Some of the scoring systems in practice to grade the severity of acute peritonitis are Acute physiology and chronic health evaluation (APACHE) II score, Simplified Acute Physiology Score (SAPS), Sepsis severity score (SSS) and Mannheim peritonitis index (MPI).<sup>4,5</sup> The need of such scoring system is to assess the severity of illness and objectively predict morbidity and mortality.

MPI was developed by Wacha and Linder in 1983 in a German retrospective study and then validated.<sup>6</sup> Of the possible twenty risk factors only eight proved to be of prognostic relevance and were entered into a score. The information is collected at the time of admission and first laparotomy.

MPI is a specific score, which has a good accuracy and provides an easy way to handle with clinical parameters, allowing the prediction of the individual prognosis of patients with peritonitis.<sup>7,8</sup>

The objectives of this study were to evaluate the spectrum of perforation peritonitis and their management and to assess the predictive value of MPI in predicting mortality and morbidity in patients with hollow viscus perforation.

### **OBJECTIVES**

The objective of the study is to evaluate the effectiveness of Mannheim Peritonitis Index (MPI) score in predicting the morbidity and mortality in patients with peritonitis due to hollow viscus perforation.

## METHODOLOGY

### **Materials and methods:**

A Prospective study of 53 patients operated for perforation peritonitis in Oxford Medical College, Bengaluru from October 2020 to August 2022. Mannheim Peritonitis Index score was calculated for each patient.

### **Inclusion Criteria :**

- Patients with clinical suspicion and investigatory support for the diagnosis of peritonitis due to hollow viscous perforation who are later confirmed by intra operative finding.

### **Exclusion Criteria:**

- Primary peritonitis (spontaneous bacterial peritonitis)
- Associated severe neurological or vascular injury that could affect the outcome.

### **Procedure:**

Initial preoperative work up and resuscitation measures were done. Standard operative procedures were followed for different causes of perforative peritonitis. Peritoneal lavage was given in all cases.

Patients were followed up postoperatively till the outcome i.e. mortality or discharge. Mortality was defined as death occurring during the hospital stay. Duration of ICU stay, hospital stay, requirement of inotropes, complications were noted. Mannheim peritonitis index was calculated for every patients included in the study. Maximal possible score is 47 and minimal possible score is zero.

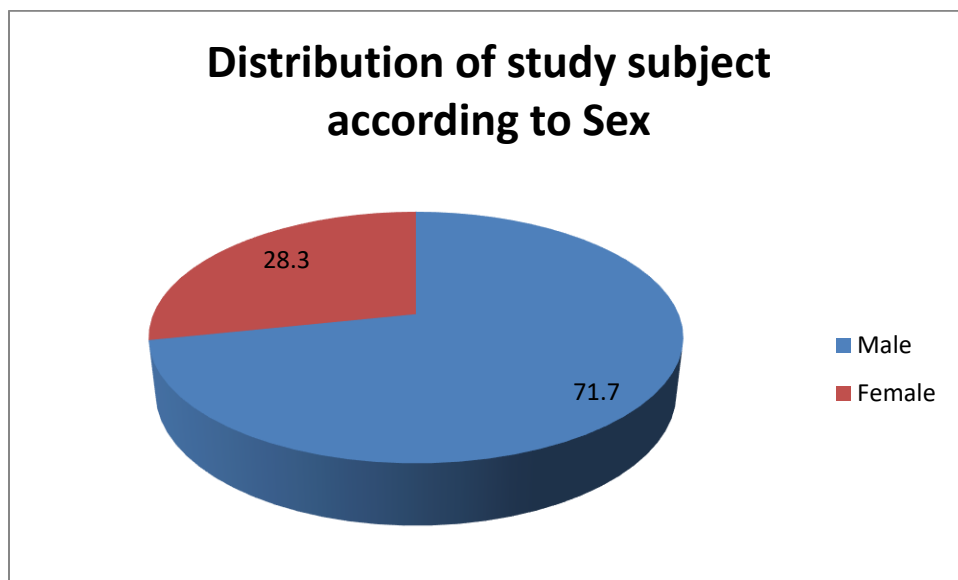
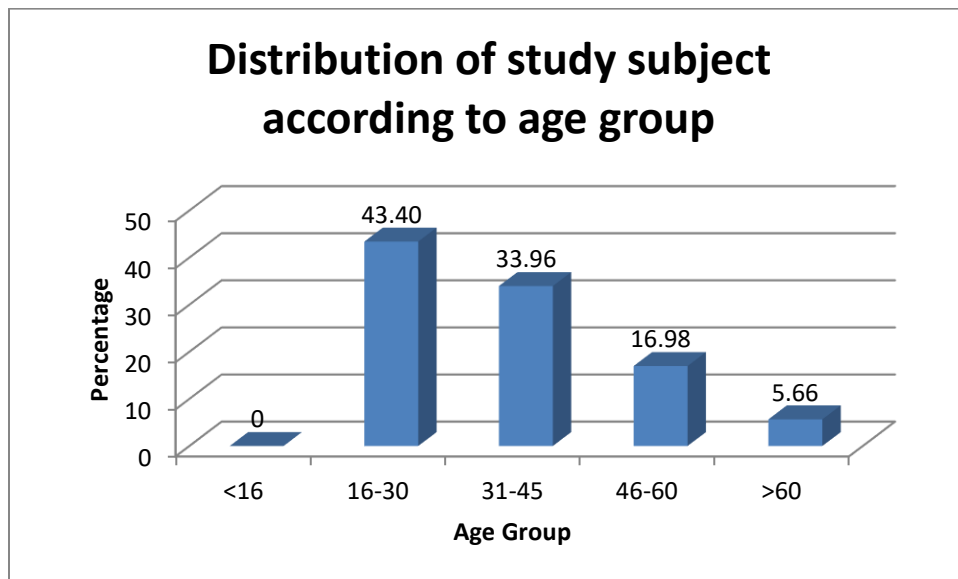
#### **STATISTICAL ANALYSIS:**

The statistical analysis was done by Pearsons Chi-square test for qualitative data, students t-test for quantitative data. Chi-squared test was used for intergroup comparisons. P value < 0.05 was taken as statistically significant in the study. Statistical significance of every single MPI inclusion criteria performed in order to verify the relevance on prognosis.

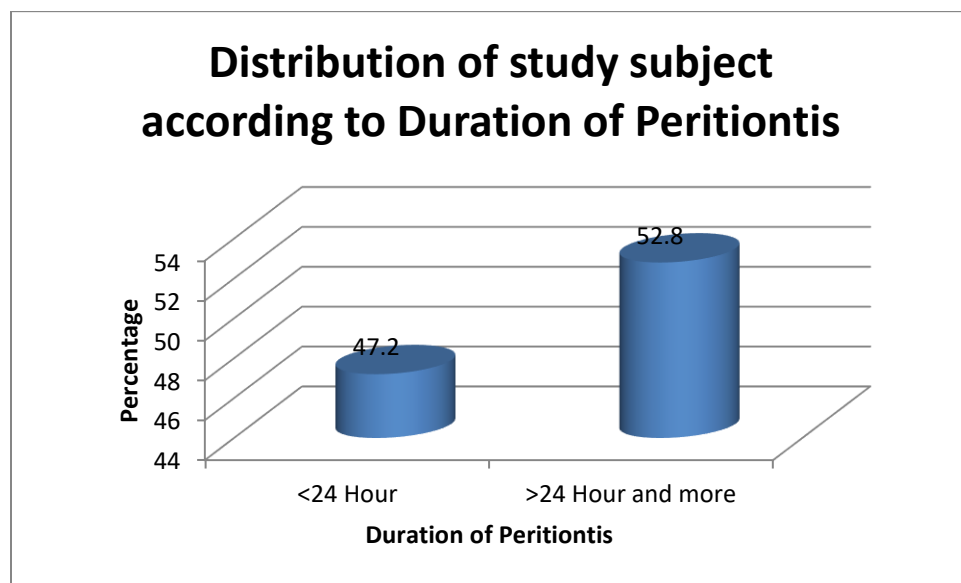
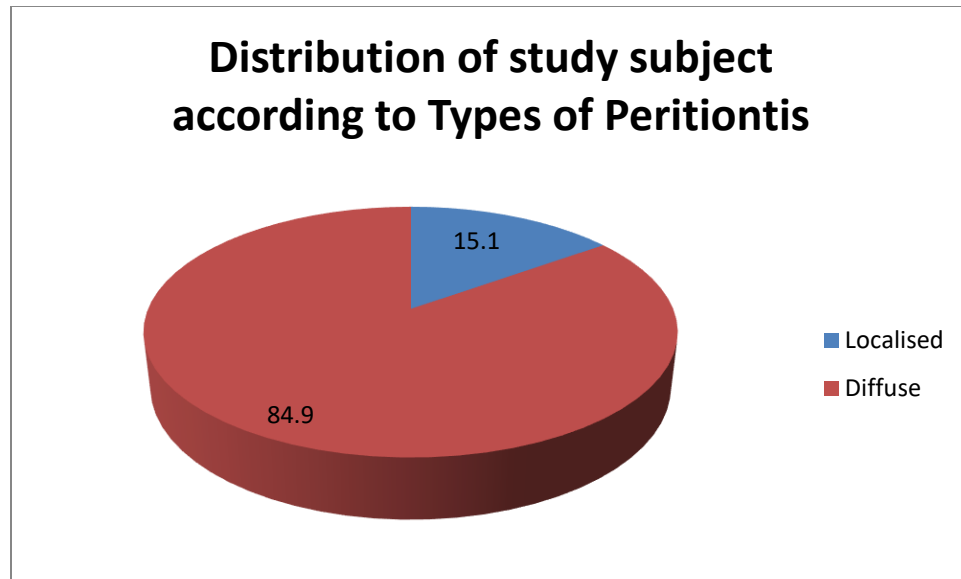
**RESULTS****OBSERVATION AND ANALYSIS****TABLE 1: DISTRIBUTION OF STUDY SUBJECT**

Variable	Frequency	Percentage
<b>Age group</b>		
<16	0	0
16-30	23	43.40
31-45	18	33.96
46-60	9	16.98
>60	3	5.66
Mean age	35.19±12.77	
<b>Gender</b>		
Male	38	71.7
Female	15	28.3
<b>DURATION OF PERITONITIS</b>		
<24 Hour	25	47.2
>24 Hour and more	28	52.8
<b>TYPES OF PERITONITIS</b>		

Localised	8	15.1
Diffuse	45	84.9
Types of fluid (Exudate)		
Clear	7	13.2
Cloudy, purulent	43	81.1
Fecal	3	5.7
MPI score		
<21	36	67.92
21-29	6	11.32
>29	11	20.75







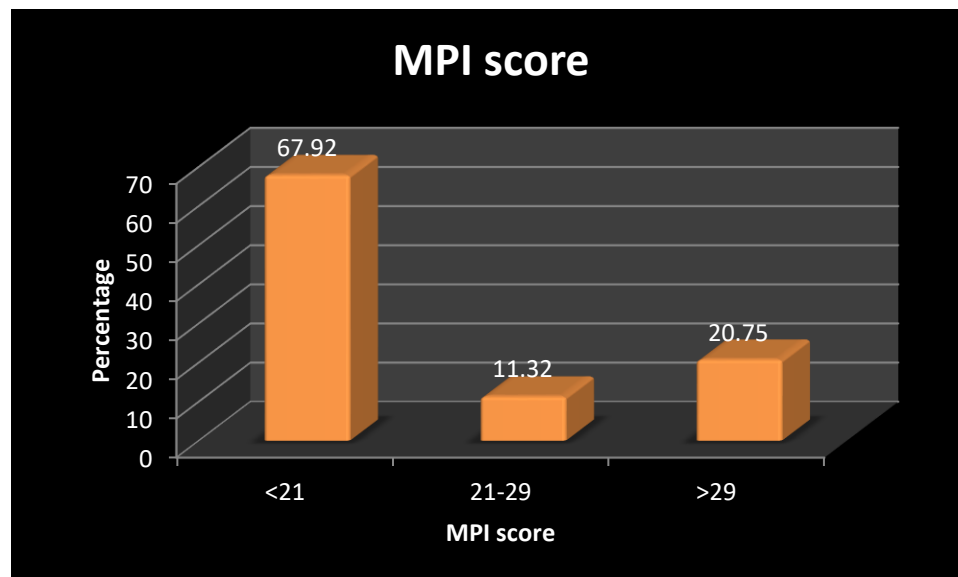
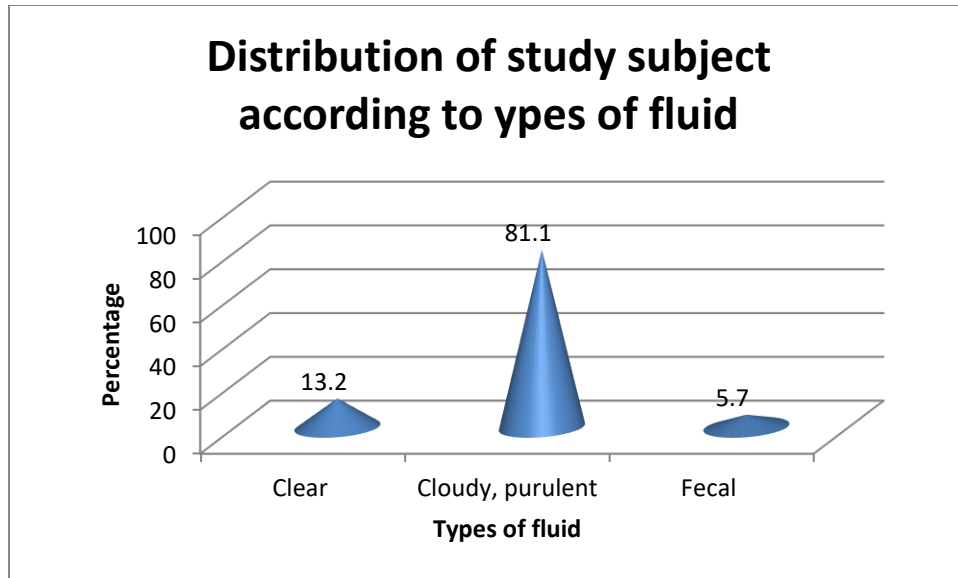


Table 2: Distribution of different variables in patients.

Variable	Present (%)	Absent (%)
<b>ORGAN FAILURE</b>	12(22.6)	41(77.4)
<b>MALGNANCY</b>	8 (15.1)	45 (84.9)
<b>Colonic origin of sepsis</b>	16 (30.2)	37 (69.8)
<b>Outcome of patients (death)</b>	5(9.43)	48(90.57)

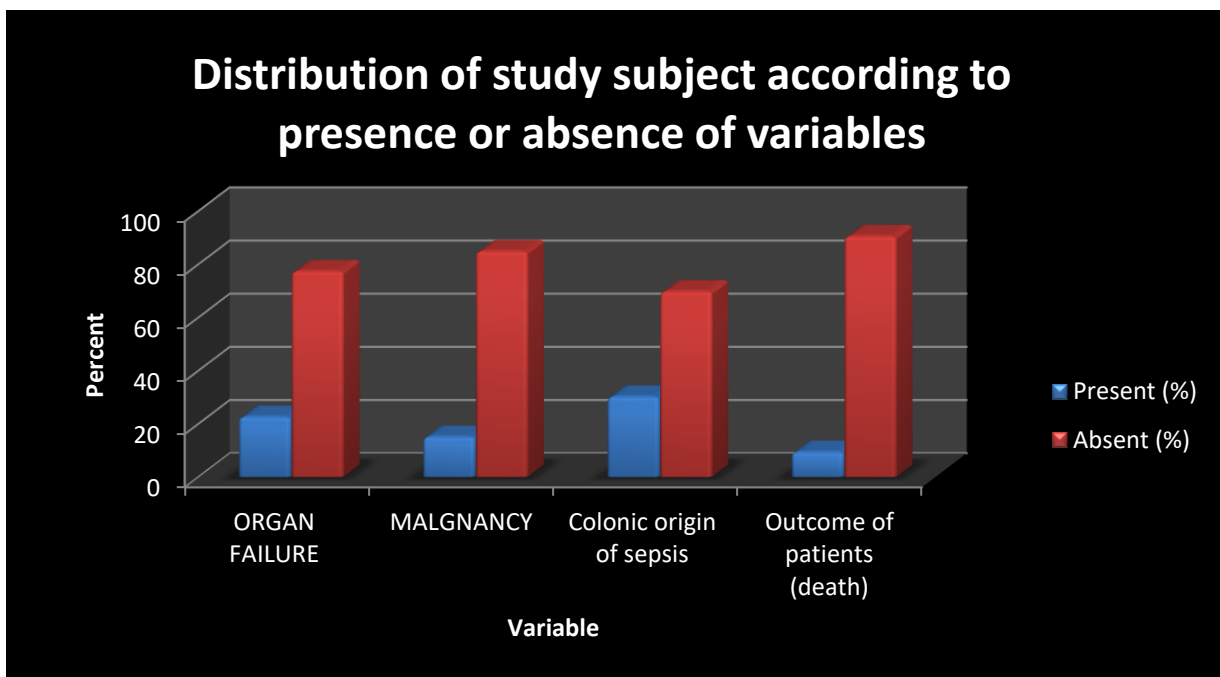


Table 3: Distribution of different variable according to declared or discharge.

Variable		Outcome Declared	Discharge	Total	Chi square test ( P value)
Age	<50 years	0	42	42	<0.0001
	>50 years	5	6	11	
Sex	Male	3	35	38	0.56
	Female	2	13	15	
Organ failure	Present	5	7	12	<0.0001
	Absent	0	41	41	
Duration	<24 hours	0	25	25	0.03
	>24 hours	5	23	28	
Malignancy	Present	2	43	45	0.02
	Absent	3	5	8	
Types of peritonitis	Diffused	5	40	45	0.42
	Localized	0	8	8	
Sepsis	Colonic	4	12	16	0.02
	Non colonic	1	36	37	
Exudates	Clear	0	7	7	0.002
	Feacal	3	40	43	
	Purulent	2	1	3	
MPI score	<21	0	36	36	<0.0001
	21-29	0	6	6	
	>29	5	6	11	

Mean age of declared patients-36.48±12.62

Mean age of discharge patients-34.43±12.39

Mean age group was  $35.19 \pm 12.77$ . Male predominant with 38 (71.7%) and female were 15 (28.3%) Duration of peritonitis was <24 hours in 25 (47.2%) cases and >24 hours in 28 (52.8%) cases. Peritonitis was localized in 8(15.1%) cases and diffuse in 45(84.9%) cases. Exudate was clear in 7 (13.2%) cases, cloudy and purulent in 43 (81.1%) cases and fecal in 03 (5.7%) cases. MPI score was <21 in 36 (67.92%) cases, 21-29 in 06 (11.32%) cases and >29 in 11 (20.75%) cases.

Perforated appendix was 21 (39.62%), peptic ulcer perforation 17 (32.07%) and duodenal perforation was 09 (16.98%) were common causes of perforation peritonitis. Organ failure was present in 12 (22.6%) cases. Malignancy was present in 8 (15.1%) cases. Colonic origin of sepsis was in 16 (30.2%) cases. Mortality was in 5 (9.43%) cases out of which 3 (5.66%) were male and 2 (3.77%) were females.

Mannheim Peritonitis Index scores of  $\leq 20$ , 21-29, and  $\geq 30$  had a mortality of 0%, 0%, and 9.43% respectively. Presence of generalized peritonitis, organ failure at time of admission, type of intra peritoneal exudates carried more significance in predicting the mortality and morbidity in the post op period than other variables.

**CONCLUSION:**

Mannheim Peritonitis Index is a simple and specific scoring system for predicting the mortality in patients with secondary peritonitis. Increasing scores are associated with poorer prognosis, needs intensive management. Hence it should be used routinely in clinical practice.

**REFERENCES :**

1. Jhobta RS, Attri AK, Kaushik R, Sharma R, Jhobta A. Spectrum of perforation peritonitis in India-review of 504 consecutive cases. *World J Emerg Surg.* 2006; 1:26.
2. Bohnen J, Boulanger M, Meakins JL, Mclean APH. Prognosis in generalized peritonitis: relation to cause and risk factors. *Arch Surg.* 1983;118:285-90
3. Chao TC, Chao HH, Jan YY, Chen MF. Perforation through small bowel malignant tumors. *J Gastrointest Surg.* 2005;9:430-5.
4. Kologlu M, Elker D, Altun H, Sayek I. Validation of MPI and PIA II in two different groups of patients with secondary peritonitis. *Hepatogastroenterology.* 2001;48:147-51.
5. Bosscha K, Reijnders K, Hulstaert PF, Algra A, van der Werken C. Prognostic scoring systems to predict outcome in peritonitis and intra-abdominal sepsis. *Br J Surg.* 1997; 84(11):1532-34
6. Wacha H, Linder MM, Feldman U, WeschG, Gundlach E, Steifensand RA. Mannheim peritonitis index-prediction of risk of death from peritonitis: construction of a statistical and validation of an empirically based index. *Theoretical Surg.* 1987; 1: 169-77.
7. Correia MM, Thuler LCS, Velasco E, Vidal EM, Schanaider A. Peritonitis Index in oncologic patients. *Revista Brasileira de Cancerologia.* 2001;47(1):63-8.
8. Melero A. Mannheim peritonitis index validation study at the Hospital General De Durango. *Cirurgia Cirujianos.* 2002; 70: 217-25.
9. Billing A, Frölich D, Schildberg FW. Prediction of outcome using the Mannheim peritonitis index in 2003 patients. *Br J Surg.* 1994;81:209- 13.
10. Karki OB, Hazra NK, Timilsina B, Kunwar D. Effectiveness of Mannheim Peritonitis Index in Predicting the Morbidity and Mortality of Patients with Hollow Viscus Perforation. *Kathmandu Univ Med J.* 2018;64(4):296-300.

