

A Clinical Study on Post-operative Outcome in Perforation Peritonitis Patients with Reference to the History of Nonsteroidal Anti-inflammatory Drugs Use

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Abstract

Background: Perforation peritonitis is a commonly encountered surgical emergency and it is defined as inflammation of the serosal membrane that lines the abdominal cavity and the visceral organs. The objective of this study is to predict a correlation between post-operative outcomes in perforation peritonitis patients with reference to the history of nonsteroidal anti-inflammatory drugs (NSAIDs) use.

Materials and Methods: A total of 209 cases were studied with hollow viscous perforation peritonitis admitted in the surgical wards in Sanjay Gandhi Memorial Hospital associated with S. S. Medical College, Rewa (M.P.), India, in the period from June 1, 2018, to May 31, 2019. All necessary investigations were carried out. X-ray, ultrasonography abdomen, and blood investigations were done. Patient underwent emergency exploratory laparotomy and a careful record of pre-operative and post-operative findings was made and was carefully filled in the pro forma. All the patients were advised to attend surgical OPD for follow-up.

Results: Most of the patients (73.2%) of perforation peritonitis had a history of NSAID intake, out of which 81.6% recovered from the disease while mortality rate in perforation peritonitis associated with NSAID use was found to be 18.4%. Those patients with no history of NSAID use (26.8%) had a mortality rate of 9% while 91% of patients of perforation peritonitis were recovered from the disease.

Conclusion: In this study, it is concluded that the outcome of the patients of the perforation peritonitis is not dependent on the history of NSAIDs use, but NSAIDs abuse is one of the etiological factors in the pathogenesis of the perforation peritonitis.

Key words: Cyclo-oxygenase, Non steroidal anti inflammatory drugs, Prostaglandins

INTRODUCTION

Gastrointestinal perforation is a common abdominal emergency faced by general surgeon. A high index of suspicion is essential to diagnose visceral perforation early,

as significant morbidity and mortality results from diagnostic delay.^[1] Nonsteroidal anti-inflammatory drugs (NSAIDs) are very effective anti-inflammatory and analgesic agents and are among the most commonly used classes of medications worldwide but are very commonly associated with the etiopathogenesis of perforation peritonitis. Mechanism of action of NSAIDs has been explained on the basis of their inhibition of the enzymes that synthesize prostaglandins. However, it is clear that NSAIDs exert their analgesic effect not only through peripheral inhibition of prostaglandin synthesis but also through a variety of other peripheral and central mechanisms. It is now known that there are two structurally distinct forms of the cyclooxygenase enzyme

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(COX-1 and COX-2). COX-1 is a constitutive member of normal cells and COX-2 is induced in inflammatory cells. Inhibition of COX-2 activity represents the most likely mechanism of action for NSAID-mediated analgesia, while the ratio of inhibition of COX-1 to COX-2 by NSAIDs should determine the likelihood of adverse effects. In addition, some NSAIDs inhibit the lipoxygenase pathway, which may result in the production of alkylogenic metabolites. Reduction in the prostaglandins synthesis by inhibition of the COX-1 and COX-2 enzymes by the use of NSAIDs reduces the mucous production by the gastric mucosal glands and hence reduces the thickness of the protective mucosal barrier which causes perforation if the irritant persists.

Omitting the use of NSAIDs, time of presentation to the hospital, early surgical intervention, and post-operative care are important factors in determining the outcome of perforation peritonitis.

Aims and Objectives

A clinical study on postoperative outcome in perforation peritonitis patients with reference to the history of Nonsteroidal Anti-inflammatory Drugs abuse.

MATERIALS AND METHODS

The proposed study entitled “A Clinical Study on post-operative outcome in perforation peritonitis patients with reference to the history of NSAIDs use” was carried out on 209 patients admitted in surgical wards in the Department of Surgery, Shyam Shah Medical College and Associated Sanjay Gandhi Memorial Hospital, Rewa, during the period of June 1, 2018, to May 31, 2019.

Inclusion Criteria

All cases of perforation peritonitis admitted in the Surgery Department of Shyam Shah Medical College and Associated Sanjay Gandhi Memorial Hospital, Rewa, and have consented for participation in the study.

Exclusion Criteria

The following criteria were excluded from the study:

1. Patients left hospital during the course of treatment
2. Patients operated outside the institution
3. Patients with traumatic perforation peritonitis
4. Patients under 13 years of age due to different physiological status
5. Post-operative peritonitis
6. All pregnant females.

Sample Size

The sample size was 209 non-traumatic perforation peritonitis patients.

Methodology

All patients were admitted in the surgical ward of Sanjay Gandhi Memorial Hospital, Rewa, for the treatment of abdominal pain due to perforation peritonitis from June 1, 2018, to May 31, 2019.

Brief history was recorded such as duration of abdominal pain, nature of pain, relieved by medication, or by change in any posture, whether associated with fever or not, associated with any comorbid conditions, any drug abuse, use of alcohol or tobacco, corticosteroids or immunosuppressants for long time, and a detailed history regarding the use of NSAIDs were recorded. After confirming the diagnosis of perforation peritonitis, patients were resuscitated and underwent exploratory laparotomy and the results were concluded. Clinical examination included complete general examination of the patient along with per abdomen examination.

The general examination was usually performed in the supine position in adequate light and with proper exposure of the patient. Per abdomen examination was done in supine position with knee flexed in adequate light and proper exposure of the patient.

Most of the patients of perforation peritonitis had abdominal pain which was constant and severe. On general

Table 1: Outcome of perforation peritonitis patients in relation to NSAIDs use

Number of patients	Total (n)	Recovered		Death	
		n	%	n	%
History of NSAID taking	153	125	81.6	28	18.4
No history of NSAID taking	56	51	91	5	9
Total	209	176	84.2	33	15.8

NSAIDs: Nonsteroidal anti-inflammatory drugs

Table 2: Recovery of perforation peritonitis patients with relation to NSAIDs use

Patients recovered (Males/Females)	History of NSAID use (n)	No history of NSAID use (n)
Recovered males	106	46
Recovered females	19	5
Total	125	51

NSAIDs: Nonsteroidal anti-inflammatory drugs

Table 3: Mortality in perforation peritonitis patients with relation to NSAIDs use

Number of deaths (Male/Female)	History of NSAID use (n)	No history of NSAID use (n)
Death in males	20	5
Death in females	8	0
Total	28	5

NSAIDs: Nonsteroidal anti-inflammatory drugs

examination, most of the patients were having tachycardia, hypotension, tachypnea, and inability to pass flatus and feces. On per abdomen examination, most of the patients had distended abdomen with diffuse tenderness along with diffuse guarding and board-like rigidity. On percussion, obliteration of liver dullness was found in most of the patients. On auscultation of the abdomen, bowel sounds were often found sluggish or absent. Tenderness was present on per rectal examination.

The presence of free gas under diaphragm in X-ray abdomen in standing position was mainstay for the diagnosis of perforation peritonitis. For the diagnosis of perforation peritonitis, X-ray abdomen has a sensitivity of 84.62% and specificity of 97.30%.

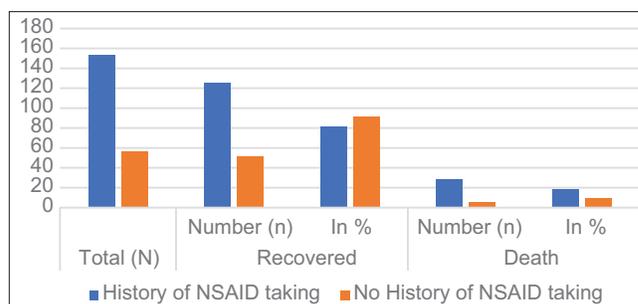
Ultrasonography, although, is not a primary modality for evaluating pneumoperitoneum, free gas can be detected on ultrasound when gas shadowing is present along the peritoneum. Ultrasonography has a sensitivity of 76.92% and specificity of 97.30% for the diagnosis of perforation peritonitis.

Computed tomography became an important tool in the detection and characterization of acute abdominal involvement in perforation peritonitis. Computed tomography imaging is often the initial modality in acute abdomen in a significant proportion of patients, and radiologists should have a high level of suspicion in detection and interpretation of peritoneal abnormalities. Contrast-enhanced computed tomography has 100% specificity and sensitivity for the diagnosis of perforation peritonitis.

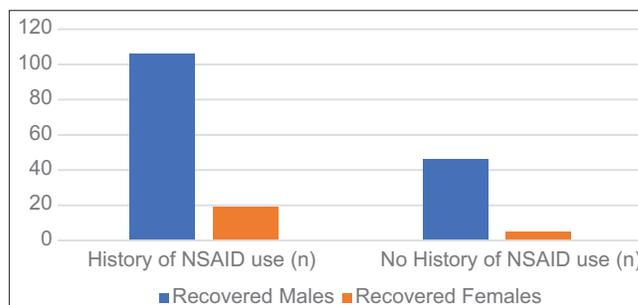
Laboratory investigations were carried out as per clinical relevance, including complete blood count, random blood sugar, serum electrolytes, renal function tests, liver function tests, blood grouping and typing, and Widal test. Thus, we observe the per abdomen clinical findings and presence of free gas under diaphragm in X-ray abdomen in standing position and results were calculated and tabulated accordingly.

OBSERVATION AND RESULTS

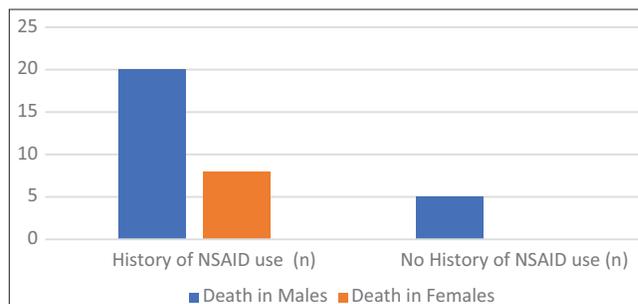
It is evident from the above data that most of the patients (73.2%) of perforation peritonitis had a history of NSAID taking [Table 1 and Graph 1], out of which 81.6% recovered from the disease [Table 2 and Graph 2] while mortality rate in perforation peritonitis associated with NSAID taking was found to be 18.4% [Table 3 and Graph 3]. Those patients with no history of NSAID taking (26.8%) had a mortality rate of 9% while 91% recovered from the disease. $P > 0.05$ is statistically insignificant which shows that after having perforation peritonitis, outcome of the patient is not dependent on history of taking NSAID.



Graph 1: Correlation between outcomes of patients with nonsteroidal anti-inflammatory drug taking



Graph 2: Recovery of perforation peritonitis patients with relation to nonsteroidal anti-inflammatory drugs use



Graph 3: Mortality in perforation peritonitis patients with relation to nonsteroidal anti-inflammatory drugs use

DISCUSSION

NSAIDs can cause damage to the gastroduodenal mucosa through several mechanisms, including the topical irritant effect of these drugs on the epithelium, impairment of the barrier properties of the mucosa, suppression of gastric prostaglandin synthesis, reduction of gastric mucosal blood flow, and interference with the repair of superficial injury. The presence of acid in the lumen of the stomach also contributes to the pathogenesis of NSAID-induced ulcers and bleeding, by impairing the restitution process, interfering with hemostasis, and inactivating several growth factors that are important in mucosal defense and repair. In the present study, it was found that 73.2% of the patients of perforation peritonitis had a history of NSAID use, out of which 81.6% recovered from the disease while mortality rate in perforation peritonitis associated with NSAID

taking was found to be 18.4%. Those patients with no history of NSAID taking (26.8%) had a mortality rate of 9% while 91% recovered from the disease. A similar study conducted by Amit *et al.*, in 2016,^[2] conducted a study and concluded that 76.9% of patients of gastric perforation peritonitis had a positive history of chronic NSAID use. The study conducted by Mukherjee *et al.*, in 2016,^[3] and found that 42% of patients were chronic NSAIDs user. In 2013, a study conducted by Chakma *et al.*^[4] on spectrum of perforation peritonitis and found that 36.84% of patients gave a positive history for chronic NSAID use in cases of duodenal perforation peritonitis. Mewara *et al.*, in 2017,^[5] conducted a similar study and concluded that 79% of patients were having the history of using NSAIDs within 15 days of perforation or before.

A study conducted by Mukherjee *et al.*, in 2016,^[3] on perforation peritonitis and concluded that the most common site of perforation was the duodenum, the cause being acid peptic disease as a consequence of NSAIDs use. In the present study, 82.6% of patients who were taking NSAIDs recovered from the disease after exploratory laparotomy while 92% of patients who were not taking NSAIDs recovered from the disease after exploratory laparotomy. A similar study done by Abdulhameed *et al.*, in 2017,^[6] on pre-operative findings and outcome of perforation peritonitis and concluded that associated factors such as smoking, alcoholism, acid peptic disease, and NSAID use increase mortality. In the present study, those patients with no history of NSAID taking (26.8%) had a mortality rate of 8%. $P > 0.05$ is statistically insignificant which shows that after having perforation peritonitis, outcome of the patient is not dependent on history of taking NSAID.

CONCLUSION

We had the study of 209 cases of perforation peritonitis in the Shyam Shah Medical College and Sanjay Gandhi Hospital, Rewa, the Vindhya region in the Madhya Pradesh. The educational status of this territory is below average,

and the peoples are very unaware of their health. Most of the people do hard work for their wages and for their tiredness they are abusing the painkillers with their empty stomach. Out of 209 cases, 153 patients have a history of using painkillers within 15 days of perforation for any reason, out of which 125 patients recovered from the disease after exploratory laparotomy while 28 patients could not survive. After analyzing the data obtained from the study, it is concluded that the NSAIDs have an etiological role in the perforation peritonitis, but it does not affect the outcome of the diseased after exploratory laparotomy.

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ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

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