DOI: 10.14260/jemds/2015/2033

ORIGINAL ARTICLE

EFFECT OF POSTOPERATIVE LIVER FUNCTION DERANGEMENT ON OUTCOME IN GASTROINTESTINAL PERFORATION PATIENTS: A PROSPECTIVE STUDY OF 100 CASES

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HOW TO CITE THIS ARTICLE:
Manju Singh, Amit Agrawal, Rohit Jain, Gambhir Singh. "Effect of Postoperative Liver Function Derangement on Outcome in Gastrointestinal Perforation Patients: A Prospective Study of 100 Cases". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 82, October 12; Page: 14294-14298,
DOI: 10.14260/jemds/2015/2033

ABSTRACT: Gastrointestinal perforation with generalized peritonitis is still associated with considerable morbidity and mortality. Intra-abdominal infections and septic conditions after surgery are frequently accompanied by cholestasis and postoperative jaundice which further increase morbidity and mortality. The aim of our study was to find out the incidence of postoperative liver function derangement in patients of gastrointestinal perforation admitted in our institute and its effect on outcome of these patients. A prospective study of 100 cases was done, 22% cases showed derangement in liver function which included changes in serum billirubin, Aspartate transaminase (AST), Alanine Transaminase (ALT) and Alkaline Phosphatase levels. Out of 100 patients 82% were males and 18% were females with mean age of 51+10 yrs. Patients with preoperative shock had more incidence of deranged liver function 43% as compared to patient with normal preoperative parameters (p value is <0.05) which is very significant. Mean hospital stay in patients with deranged liver function was 23+12 days as compared to patients with normal liver functions 14+6 days. Complication were high wound infection rate 81%, delayed wound healing 64% and leak 64% in patients with deranged liver function which showed significant association(p value <0.05). Mortality was also high in these patient 27% as compared to 8% in patients with normal liver function. In conclusion post-operative derangement in liver function is associated with advanced age, preoperative shock, and prolonged waiting for surgery which affected the outcome of patients of gastrointestinal perforation and increases their morbidity and mortality.

KEYWORDS: Gastrointestinal perforation, hyper-billirubinaemia, liver function test, alkaline phosphatase.

INTRODUCTION: Gastrointestinal Perforations with generalized peritonitis are still associated with considerable mortality and morbidity.[1] The mortality rates of patients with peritonitis or sepsis increases when organ dysfunction coexists.[2,3] Intra-abdominal infection and septic conditions after surgery are frequently accompanied by cholestasis and post-operative jaundice which are thought to be mediated in part by inflammatory cytokines and part by hypoxia which may predispose to multiple organ failure.[4] Reversible minor changes in liver function are common in the immediate post-operative period but the relative contribution of anaesthesia and surgical stress cannot be quantitated. The reduction of hepatic blood flow by both regional and general anaesthesia together with the surgical stress produces a mild impairment of liver function.[4,5,6] Post-operative jaundice is present in up to 20 percent of patients undergoing major surgery. Most cases are never diagnosed because there are few pathognomonic features and liver function often normalizes quickly without specific treatment.[7]

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Severe post-operative jaundice most frequently follows a prolonged and complicated operation and stormy postoperative course in which hypotension and hypoxaemia have occurred which lead to poor outcome of these patients and increases mortality rates in patients of gastrointestinal perforation.[7,8,9,10] The present study was conducted in 100 cases of gastrointestinal perforation to find out the incidence of postoperative liver function derangement and its effect on outcome of these patients in Dr. B.R.A.M. hospital and Pt. JNM medical college Raipur.

OBJECTIVES OF STUDY:

1. To find out the incidence of post-operative liver function derangement in patients of gastrointestinal perforation.
2. To assess the outcome of these patients.

MATERIAL AND METHODS: A prospective study of 100 cases of gastrointestinal perforation was conducted in a period of 1 year. Patients of age more than 15 years of both sexes with gastrointestinal perforation who underwent exploratory laparotomy were included in the study. Patients who had deranged liver function at the time of admission were excluded from the study.

Detailed clinical history was taken at the time of admission and diagnosis was established by clinical examination, blood investigations and abdominal radiography including Ultrasonography of abdomen. Appropriate anaesthesia was given and exploratory laparotomy with definitive procedure was done according to type of perforation and noted. The drugs used in anaesthesia were also duly noted.

The Liver Function Tests: Serum billirubin–conjugated, unconjugated, AST, ALT, alkaline phosphatase, serum albumin were performed on the day of admission and thereafter on 1st, 3rd, 7th, 10th, 15th Post-operative day and thereafter if required. The postoperative outcome was compared in terms of wound complications, leak, hospital stay and mortality between patients with normal liver function and patients with deranged liver function. Significance of association was determined by p value by Fisher's exact test.

OBSERVATION: Out of 100 patients included in the study 22% showed derangement in liver function Post operatively (group A) and 78 % patients showed normal liver function test (group B). Highest incidence of deranged liver function was found in >50 years age group which is significant as determined by p value (<0.05) as shown in Table 1. In Group A 18 patients were male and 4 patients were female which showed no significant association with liver derangement. Pre-operative systemic disease showed no significant difference in incidence in both the groups. Pre-operative shock had strong association with deranged liver function p value <0.05(Table 2). Post operatively serum level of Billirubin – conjugated, unconjugated, AST, ALT and alkaline phosphatase showed gradual increase in level on 3rd -7th day and thereafter gradually returns to normalcy in patients who were discharged but in patients who died there was continuous increase in the values observed. Direct billirubin (91%) and alkaline phophatase (96%) was raised in most of the patients (Table 3). Group A patients had more prolonged septicaemia (32%) than Group B(9%) which showed significant association p value <0.05. Patients in group A had prolonged hospital stay (mean 23+12 days), increased incidence of wound infection 81%, delayed wound healing 64% and leak 64% following surgery which was

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significant (p value <0.05) (Table 4). Mortality was higher in Group A (27%) as compared to Group B (8%) which was statistically significant (p value <0.05).

AGE (in YRS)	Group A		Group B		Total	p Value
	No.	%	No.	%		
0-19	2	29%	5	71%	7	0.0465 (<0.05)
20-39	3	12%	23	88%	26	
40-49	5	15%	29	85%	34	
>50	12	42%	21	58%	33	

Table 1: Distribution of Patients according to age

Condition on Admission	Group A		Group B		Total	p Value
	No	%	No.	%		
Shock	10	45%	17	22%	27	0.006(<0.05)
No shock	12	55%	61	88%	73	

Table 2: Comparison of pre-operative Shock

Liver Function Test	No.	% of Total
Direct bilirubin (>0.5 mg/dl)	22 (22)	100
Indirect billirubin (>1mg/dl)	18 (22)	82
SGOT (>90U/l)	13 (22)	59
SGPT (>90U/L)	09 (22)	41
Alkaline phosphatase (>200U/L)	21 (22)	96
Deranged PT/INR Ratio	09 (22)	41
Albumin (<3gm%)	16 (22)	73
A/G Ratio (<1)	18 (22)	82

Table 3: Individual Deranged liver Function

COMPLICATION	GROUP A	GROUP B	p Value
Duration of hospital stay	23+12 days	14+6 days	
Wound infection	18(81%)	30(38%)	0.005 (<0.05)
Delayed Wound healing	14(64%)	20(26%)	0.0018 (<0.05)
Leak	5(23%)	1(1.3%)	0.0018 (<0.05)
Mortality	6(27%)	6(8%)	0.022 (<0.05)

Table 4: Comparison of Morbidity and Mortality

DISCUSSION: Gastrointestinal perforation continues to be the most common indication for exploratory laparotomy in our Institute. In our study incidence of postoperative liver function derangement in patients of gastrointestinal perforation was comparable to other study.

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Decreased hepatic blood flow, infection, drugs, anaesthetic agents and overwhelming inflammatory cytokines are postulated to be contributory. The precise cause of post-operative hepatic injury remains unelucidated.[7,11] Highest incidence was found in age group 50 years and above because incidence of perforation peritonitis is common in this age group, no significant association of gender was found in the study which is comparable with other studies.[11] In this study patients of group A had higher incidence of prolonged septicaemia (32%) which was very low as compared to study in Japan (82%) but has got significant association in our study also. Deranged liver function with low serum albumin increases the intra-abdominal sepsis, generalised septicaemia and is accompanied by high mortality.[12,13] In present study direct billirubin and alkaline phosphatase were raised in many patients, whereas rise in AST and ALT level was not significant. The overall picture of LFT suggested cholestatic form of jaundice.

This fact is supported by studies that there is no damage but dysfunction of hepatocytes. The dysfunction is either derangement in permeability of hepatocytes to billirubin or depressed function of ductile enzymes (Na^+K^+ATPase) leading to cholestasis, regurgitation and mixed type of hyperbillirubinaemia.[14,15,16] The changes in postoperative serum billirubin and liver enzyme levels was maximum on 3rd-7th day. Similar results were observed by T. Nishida, there were a transient increase in serum billirubin in patients who survived and reaches highest level on 3rd -5th postoperative day, those who died showed no decline in value even after 10th -15th day.[7] In our study mean hospital stay and postoperative complications in Group A showed significant association which is supported by various studies. The infectious complications and deranged liver function are poor prognostic factors in patients operated for Gastrointestinal perforation[17,18] Post-operative complication and mortality rate in our study is comparable to the study done by T. Nishida.[7] in which post-operative complication were observed in 77% with mortality rate of 59% of patients with deranged liver function.

CONCLUSION: Post-operative liver function derangement is seen in patients of gastrointestinal perforation with advanced age, preoperative shock, infection and septicemia. These results strongly suggest that post-operative liver function derangement in patients of gastrointestinal perforation associated with poor prognosis which reinforces the importance of good post-operative care, improvement in nutritional status, control of septicemia and judicious use of drugs including anesthesia to prevent mortality in these patients.

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FINANCIAL OR OTHER COMPETING INTERESTS: None

Date of Submission: 20/09/2015.
Date of Peer Review: 21/09/2015.
Date of Acceptance: 03/10/2015.
Date of Publishing: 09/10/2015.