Original Article

Incidence of Bacterial Infections Following Elective Endoscopic Variceal Ligation of Cirrhotic Patients in a Tertiary Care Hospital

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Abstract

Background: *Esophageal varices are the consequence of portal hypertension which occurs mostly due to chronic liver disease and bleeding from rupture of this is one of the modes of death. Endoscopic variceal ligation (EVL) till date is recommended and most accepted method of treatment for prevention of both acute and chronic variceal bleeding of cirrhotic patients. Cirrhotic patients are vulnerable to have infection and it is expected to be augmented by any kind of intervention. Endoscopic variceal ligation being used as a modality of treatment, have the potentiality to cause infection in cirrhotic patients and empirical antibiotic prophylaxis is widely practiced in elective EVL but data regarding this is scanty and hence this study was undertaken in the Dept of Gastroenterology from January,2019 to December, 2019.*

Aims: *To see the incidence of bacterial infection in cirrhotic patients following elective EVL.*

Methods: *Fifty four patients were enrolled fulfilling the inclusion and exclusion criteria. Clinical evaluation and biochemical parameters including CBC, CRP, Blood culture, serum billirubin, serum albumin and PT were done. Fifty four EVL sessions were done and in each session, two to six bands were applied. Patients were followed up for 24 hrs to see any clinical signs of infection and CBC, CRP, Blood culture were done at 24 hrs of EVL.*

Results: *Among fifty four subjects, male were 39(72.2%), and female were 15(27.8%) with mean age 46.62 ± 1.34. Eight patients were in Child Pugh A, 43 in Child B and 3 in Child C class (Child Pugh classification is used to see prognosis in Cirrhosis comprising Encephalopathy, serum billirubin, serum albumin, PT and ascites) . Hepatitis B virus was found to be the most common etiology. Only one subject of Child B class had neutrophilllic leukocytosis with normal other parameters of infection. All other patients did not show any features of infection both clinically and biochemically.*

Conclusions: *The incidence of bacterial infection was found to be an uncommon event following elective EVL in this study.*

Key Words:
EVL, Cirrhosis, Bacterial infections.

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Introduction:

Cirrhosis of liver is a common liver disease and variceal hemorrhage is one of the dreaded complications as well as an important cause of morbidity and mortality of cirrhosis[1]. Esophageal variceal ligation is the recommended treatment of both primary and secondary prophylaxis of esophageal variceal bleeding[1]. Bacterial infections are a frequent event in cirrhosis and it is assumed that invasive procedures poses a higher risk particularly in advanced disease[2], and which may complicate in the form of sepsis and sepsis related death[3]. Bacterial infections are one of the leading causes related to death in cirrhotic patients accounting 30

to 50% either directly or indirectly and also predict rebleeding[4]. In hospitalized patients this risk is about 5 to 7% then the general population[4,5]. The most common bacterial infections are bacteremia, spontaneous bacterial peritonitis, urinary tract infections, and pneumonia[5]. Occurrence of bacterial infection probably results from hypoglobunaemia, complement deficiency, defective opsonization, neutrophil dysfunction and decreased phagocytic activity of the reticuloendothelial system in cirrhotic patients[6]. Transient episode of bacteremia may occur following endoscopic variceal ligation (EVL) due to mucosal trauma and consequent translocation of endogenous microbial flora in the blood stream, that is favored by portal hypertension[2,6,7]. The incidence of transient bacteremia is 3-6%[7-10], but the sequelea of this bacteremia to clinically significant infection is only 1.8%[7,10]. Up to now the incidence of bacteremia following elective EVL in cirrhotic patients has been investigated in a limited number of studies with heterogeneous and conflicting results, most of them evaluated blood culture within two hours of the procedure[2,7,10]. Whereas there is a clear indication of using prophylactic antibiotic in acute variceal bleeding, there is no such evidence of using antibiotics prophylactically in elective EVL[2]. As a tradition antibiotic is used as prophylaxis in elective EVL and there is limited information regarding this issue, so this study was conducted to evaluate the necessity of using prophylactic antibiotics in elective EVL. Band ligation is one of the frequently used procedures for both primary and secondary prophylaxis of esophageal varices. Prophylactic antibiotics are traditionally used in elective EVL without any strong evidence. This leads to inappropriate use of antibiotics and may also be one of the causes of resistance. So this study was conducted in the department of Gastroenterology of Shaheed Suhrawardy Medical College Hospital to evaluate the appropriateness of using prophylactic antibiotics in elective EVL.

Materials and Methods:

This cross sectional observational study was conducted during the period of April, 2019 to December, 2019 in Department of Gastroenterology, Shaheed Suhrawardy Medical College

Hospital**.** Purposive sampling was used. Admitted patients who fulfilled the inclusion criteria were included in the study. Having taken the ethical clearance from the ERB of ShSMCH the protocol was approved by the BCPS. Patient's data including demographic characteristics, investigations relevant to cirrhosis of liver and to rule out infection CBC, CRP and blood culture were sent before endoscopy. After coming reports those who were negative undergone endoscopy and EVL was performed for varices (grade II-III, grade III, grade III-IV and grade IV). EVL were performed by expert gastroenterologists in the department with PENTAX **(**EG2990i 2.8) and V grip six band ligator were used. For each session at least 2 to 6 bands were applied and hemostasis were maintained properly. Before each procedure endoscope was sterilized by CIDEX (2.4% gluterldehyde) for 30 mins. Before or After EVL no antibiotic was given. Patients were observed for 24 hrs for any clinical evidence of infection. CBC, CRP and blood culture were sent into the department of microbiology of Shaheed Suhrawardy Medical College at 24 hrs of the procedure .After collection of all relevant information these data was checked, verified for consistency & edited for finalized result. After editing & coding, the data were directly entered into the computer by using the SPSS (Statistical Package for Social Sciences) version – 16 software.

Results:

Patients having cirrhois admitted in Gastroenterology department of ShSMCH in between period from April 2019 to December 2019 who had fulfilled the inclusion criteria were included into the study. Fifty four patients were eventually enrolled for the study. In this study, the mean age of the subjects was 46.62 ± 1.34 years (range 20-80).Among the study population, 39 (72.2%) were male and 15 (27.8%) were female. Based on clinical and biochemical parameters, 14.8% patients were categorized as Child Pugh A, 79.6% were B and 5.6% were in C group. Among the study subjects, only one patient in Child Pugh B had neutrophilllic leukocytosis at 24hrs of EVL but culture and other parameters of infection were negative.

Table I:

Gender distribution of the respondents (n=54)

Variables	n(%)
Age in years (mean ± SD)	46.62 ± 1.34
Male, n (%)	39(72.2)
Female, n (%)	15 (27.8)

n= total number SD= Standard deviation.

Table II

Clinical characteristics of the respondent's n (54)

Clinical characteristics	n (%)
Jaundice	17(31.5)
Haematemesis	19(35.2)
Meleana	23(42.6)
Anaemia	20(37)
Ascites	
None	5(9.3)
Mild	47(87)
Marked	2(3.7)
Splenomegaly	24(44.4)
Encephalopathy	
None	50(92.6)
Mild	4(7.4)
Diabetes Mellitus	6(11.1)

n= total number.

Table III

Distribution of the study populations by etiology

Etiology	n (%)
HBV	34 (63%)
Non B non C	19 (35.1%)
HCV	1 (1.9%)

n= total number.

Table IV

Biochemical profile of the respondents (54)

Biochemical profile	n (%)
Serum Billirubin	
< 2 mg/dl	49(90.7)
2 to 3 mg/dl	5(9.3)
Serum albumin	
< 2.8 mg/dl	17(31.5)
2.8 to 3.5mg/dl	37(68.5)
Prothrombin time	
<4 sec prolonged	51(94.4)
4 to 6 sec prolonged	3(5.6)

n= total number.

Table V

Distribution of the study populations by Child Pugh Score n (%)

Child Pugh Score	n (%)
A (<7)	8(14.8)
B (7 to 9)	43(79.6)
C (>9)	3(5.6)

n= total number.

Table VI

Fever at 24 hrs of EVL with the severity of cirrhosis n (%)

Severity (Child Pugh score)	Fever n (%)
Child Pugh A	0
Child Pugh B	0
Child Pugh C	0

n= total number

Table VII

Neutrophilic leukocytosis at 24 hrs of EVL with the severity of cirrhosis n (%)

Severity (Child Pugh score)	Neutrophilic leukocytosis n (%)
Child Pugh A	0
Child Pugh B	1(2.38%)
Child Pugh C	0

n= total number.

Table VIII

Elevated CRP at 24 hrs of EVL with the severity of cirrhosis

Severity (Child Pugh score)	Elevated CRP n (%)
Child Pugh A	0
Child Pugh B	0
Child Pugh C	0

n= total number

Table IX

Positive blood culture at 24 hrs of EVL with the severity of cirrhosis n (%)

Severity (Child Pugh score)	positive blood culture n (%)
Child Pugh A	0
Child Pugh B	0
Child Pugh C	0

n= total number.

Discussion

EVL is the most used procedure nowadays for the treatment of both emergency and elective variceal bleeding. Main concern of this study was to detect the development of infection after elective EVL of selected patients as evidenced by both clinically and biochemically.After fulfilling the inclusion criteria, around 54 patients were subjected to elective EVL in the department of Gastroenterology, ShSMCH, Dhaka, from April 2019 to December 2019.In this study, the mean age of the subjects was 46.62 ± 1.34 years. Among the study population, 72.2% were male and 27.8% were female. Alam MS et al found mean age 41.77±12.54 years and male and female were 90% and 10% , and mean age 50.1±12.6 and male 67.5% and female 32.5% were found by Maulaz EB et al . The mean age and sex difference of the above studies correlate with the present study. Among the etiology HBV is 63%, Non B Non C is 35.1% and HCV is 1.9% found in this study. HBV72%, Non B Non C 15% and HCV 10% was found by Alam MS et al. These findings are consistent with our study. Maulaz EB et al found alcohol 35%, HCV 30% and HBV 5% in his study that is not consistent with our study. This inconsistence might be due to cultural difference from our country.Child Pugh A 8%, B 43% and C 3% are found in this study. S. Maimone et al found 48.3% in Child Pugh A , 43.3% in B and 8.4% in C in his study. These findings are consistent with this study. In this study only one case developed Neutrophilic leukocytosis (2.38%) in Child Pugh B class but no evidence of infection clinically and biochemically is not found at 24 hrs of elective EVL.Alam MS found 4%

transient bacteremia detected in 5 and 30 mins of culture after EVL but there is no clinical sequelea of this transient bacteremia. S. Maimone et al found 2.7%, Bonilla DQ et al found 4.6%, Maulaz EB et al found 2.5%, of transient bacteremia but there is no clinical or biochemical evidence of infection or sequelea of bacteremia is found. Infectious sequelea is 1.8% found by Lo G-H. These findings apparently correlate with our study.

Conclusion:

In this study only one case developed Neutrophilic leukocytosis (2.38%) in Child Pugh B class but no positive culture was found at 24 hrs of elective EVL. So the rate of bacterial infection following elective EVL was not significant and use of prophylactic antibiotics in elective EVL may not be needed.Further multicenter, large scale studies with larger sample size with frequent cultures after the procedure may be recommended.

Limitations of the study: The study population was selected from a single center in Dhaka city, so that the results of the study may not be reflect the exact picture of the country.Blood culture is taken only after 24 hrs of EVL. Frequent culture should be taken after 5 min, 30 min and 24 hrs of the procedure could have been better.Sample size is small.

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