

Factors Predicting In-Hospital Mortality in Patients with Liver Cirrhosis

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ABSTRACT

Objective: To determine the predictors of in hospital mortality in gastro esophageal variceal (GEV) hemorrhage/bleeding in patients of chronic liver disease.

Study Design: Cross sectional study

Place and Duration of Study: This study was conducted at the gastroenterology department of Nishtar hospital, Multan in duration of one year from March 2019 to March 2020 in one-year duration.

Materials and Methods: A total of Two hundred and sixty patients were enrolled in present study. Clinical signs and laboratory investigations were correlated for prediction of in hospital mortality.

Most common laboratory investigations include serum bilirubin and creatinine and clinical parameters were bleeding within 24 hours after endoscopy, ascities and Child-Pugh score. Data analysis was done by using SPSS version 23.

Results: In our study Hemoglobin was found deranged in 5.2% patients, prothrombin time in 7.6%, S. bilirubin in 4.8%, S. creatinine in 8.7% and S. albumin in 2.6% of the survivors Similarly hemoglobin was found in 10%, prothrombin time in 3.3%, S. bilirubin 6.7%, S. creatinine 6.7% and S. albumin in 3.3% of the non-survivors. Differences was calculated statistically insignificant.

Conclusion: Deranged serum creatinine, serum bilirubin, PSE and re-bleed within 24 hours of endoscopy were independent predictors of in hospital mortality. Aggressive control on laboratory and clinical values with latest innovative management is helpful in reduction of in hospital mortality.

Key Words: Gastro-esophageal varices, Liver Cirrhosis, Endoscopy, Serum creatinine, In hospital mortality.

Citation of article: Umar Q, Ali A, Shahwar D, Bashir F, Ibrahim M. Factors Predicting In-Hospital Mortality in Patients with Liver Cirrhosis. Med Forum 2021;32(9):88-91.

INTRODUCTION

Gastro esophageal variceal (GEV) bleeding because of portal hypertension is the main complication in patients of liver cirrhosis¹. In 30% of cirrhotic patients its incidence is accompanied by 90% bleeding episodes. GEV hemorrhage is responsible for major hospital cost, morbidity and mortality as compare to any other bleeding of gastrointestinal tract².

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Received: April, 2021

Accepted: July, 2021

Printed: September, 2021

Worldwide about fifty percent of cirrhotic patients died within six months after 1st episode of GEV bleeding.

Usually GEV bleeding starts after the blockage of normal blood flow to liver due to clot or scar in vessels³.

Body tried to overcome this deficiency in flow of blood to hepatic system via smaller vessels but they are unable to fulfill huge requirement because of smaller diameter⁴. Sometime this blockage cause rupture of vessels and develops a life threatening blood loss which may lead to loss of life⁵. A significant decrease in mortality was observed because of latest innovation in management plans of GEV hemorrhage and instrumental advancement⁶. Main contributing factors of GEV bleeding and mortality are older age, advance Child-Pugh score, hepatocellular carcinoma, re-bleeding after endoscopy, encephalopathy and renal failure⁷.

Many authors conducted reports on different regions and reported very slow prognosis and some of them observed that prognosis varies region to region⁸. Chronic liver disease (CLD) is progressively moving illness and GEV bleeding is a big cause of hospital admission in Pakistan⁹. Increase in hospital admission continuously developing a pressure on health care system of country. In hospital mortality statistics after

CLD and GEV bleeding are much higher in Pakistan (8-50%) as compare to any other country of this region¹⁰. Purpose of study is to determine the incidence of gastro-esophageal variceal bleeding and its role in hospital mortality in cirrhotic patients.

MATERIALS AND METHODS

Study was completed at gastroenterology department of Nishtar hospital, Multan in one year duration from March 2019 to March 2020. Ethical approval was obtained from hospital ethical board before start of study. Informed written consent was taken from patients. Sampling technique was non probability consecutive sampling. Patients of age between 14 years to 60 years presented with HEV bleeding because of chronic liver disease were enrolled in the study.

All patients of GEV bleeding were shifted to high dependency unit of hospital where essential monitoring patient's hemodynamics and high trained staff with quality care was available. Facility of endoscopy along with vasoconstrictors like terlipressin and octreotide was also available 24/7. Variceal band ligation with good visibility is the treatment of choice in these patients. Option of re-endoscopy was available for patients in case of significant re-bleed, frank hematemesis, malena, fresh blood in nasogastric tube and hemodynamic instability. Hemodynamic instability was labeled in case of hemoglobin drop more than 2mg/dl.

After complete surgical assessment by team of surgeons any kind of surgical intervention was performed if needed. Surgical management may be needed in patients who were re-bleeding after endoscopy or at least two episodes after endoscopy. Patients who needed surgical intervention were managed with transjugular intrahepatic portosystemic shunt (TIPSS). Laboratory investigation and clinical condition of patients was correlated for assessment or prediction of re-bleed within 24 hours or mortality. Common parameters were serum bilirubin, hemoglobin level, serum creatinine and prothrombin time.

Imaging investigations, biochemical parameters and liver biopsy were used for CLD diagnosis. Hepatocellular carcinoma was labeled if space occupying lesion was seen on ultrasound, on liver biopsy report and serum alpha fetoprotein level was also raised. Ascites grading was also labeled as "tense" or "absent". Its control with diuretics was labeled as easy control and association with respiratory distress labeled as tense.

SPSS version 23 was used for calculation of mean value and standard deviation (SD) of continuous variables like age. Frequency/percentage were calculated for qualitative variables like gender, ascites, portosystemic encephalopathy, cirrhosis with HCC, child Pugh class cirrhosis alone and thrombosis of portal vein. Test of significance (chi-square and t-test)

were applied to see association among variables. Probability value ≤ 0.05 was taken as significant.

RESULTS

A grand total of two hundred and sixty patients of both gender male or female were enrolled in the study. The patients were assigned into group's survivors and non survivors. Survivors include n=230 (88.5%) and n=30 (11.5%) non-survivors. In survivors group mean age of patients was 42.19 ± 3.35 years and male gender was dominant with percentage of 66.5% and females 33.5%. Similarly mean age of the non-survivors was 41.93 ± 3.84 years with 76.7% males' gender and 23.3% females. Diagnosis of patients like ascites, child-Pugh score, and PSE was presented in table I. Significant difference was observed in re-bleeding within 24 hours of endoscopy ($p=0.000$). (Table. I).

Table No.1: Demographics and clinical parameters in survivors and non survivors

In survivors and non survivors			
Variable	Survivors n=230 (88.5%)	Non-survivors n=30 (11.5%)	P- value
Age (years)	42.19±3.35	41.93±3.84	0.660
Gender			
Male	n=153 (66.5%)	n=23 (76.7%)	0.264
Female	n=77 (33.5%)	n=7 (23.3%)	
Diagnosis			
Cirrhosis alone	n=172 (74.8%)	n=25 (83.3%)	0.304
Cirrhosis + HCC	n=51 (22.2%)	n=8 (26.7%)	0.581
Cirrhosis + PVT	n=15 (6.5%)	n=2 (6.7%)	0.976
Cirrhosis + HCC + PVT	n=5 (2.2%)	n=2 (6.7%)	0.153
Child-Pugh class			
A	n=29 (12.6%)	n=4 (13.3%)	0.911
B	n=42 (18.3%)	n=9 (30.0%)	0.128
C	n=157 (68.3%)	n=22 (73.3%)	0.573
Ascites			
Absent	n=55 (23.9%)	n=7 (23.3%)	0.944
Easily controlled	n=159 (69.1%)	n=18 (60.0%)	0.313
Tense	n=15 (6.5%)	n=3 (10.0%)	0.480
PSE			
Absent	n=200 (87.0%)	n=29 (96.7%)	0.123
Stage 1 or 2	n=28 (12.2%)	n=5 (16.7%)	0.487
Stage 3 or 4	n=16 (7.0%)	n=2 (6.7%)	0.953
Re-bleeding within 24 h	n=20 (8.7%)	n=19 (63.3%)	0.000

In this study Hemoglobin was found deranged in 5.2% patients, prothrombin time in 7.6%, S. bilirubin in 4.8%, S. creatinine in 8.7% and S. albumin in 2.6% of the survivors Similarly hemoglobin was found in 10%, prothrombin time in 3.3%, S. bilirubin 6.7%, S.

creatinine 6.7% and S. albumin in 3.3% of the non-survivors. Differences was calculated statistically insignificant. (Table. 2).

Table No.2: Laboratory parameters among survivors and non survivors

Variable	Survivors n=225	Non-survivors n=25	P-value
Hemoglobin (g/dL)	n=12 (5.2%)	n=3 (10.0%)	0.291
Prothrombin time (s)*	n=17 (7.4%)	n=1 (3.3%)	0.614
S. bilirubin (mg/dL)	n=11 (4.8%)	n=2 (6.7%)	0.234
S. creatinine (mg/dL)	n=20 (8.7%)	n=2 (6.7%)	0.707
S. albumin (g/dL)	n=6 (2.6%)	n=1 (3.3%)	0.818

DISCUSSION

Gastrointestinal bleeding because of portal hypertension in patients of chronic liver disease is the leading cause of in hospital mortality. Recent advancement in management of GEV bleeding like terlipressin, prophylactic antibiotic, TIPSS and variceal band ligation reduce its incidence and mortality rate¹¹. In hospital mortality rate of our hospital is much higher than other hospitals of our region.

In a study Pauwels et al¹² concluded that in hospital mortality ratio reduced 50% in last 15 years in patients who were admitted due to variceal bleeding and chronic liver disease. This significant decrease is just because of early availability of specialized care and innovative bleeding management system. Chojkier et al¹³ conducted a study on this topic and concluded that 35% mortality in cirrhotic patients is just because of bleeding disorder.

In 2000 another study was conducted by Afessa et al¹⁴ and investigated frequency of in hospital mortality with 21% observation of mortality which is much lesser proportion from last few years.

Another similar study found 14.2% mortality rate due to bleeding of variceal in cirrhotic patients¹⁵. This is also a reduced rate of mortality just because of latest innovation in management procedure and advance diagnostic measures.

Continuous reduction in incidence of mortality shows an aggressive control of disease and vast research work in previous years which much helpful to overcome disease problem and associated complications. Another study was conducted by Del Olmo et al¹⁶ in 2000 on large sample size of cirrhotic patients who were admitted for the management of GEV hemorrhage and observed 7.4% decline in mortality rate. A significant improvement was found deranged laboratory values

like serum bilirubin, serum creatinine after early endoscopy.

In year 2004 a study was conducted by Carbonell et al¹⁷ and estimated similar conclusion that survival from in hospital can be improved with use of skillful hands and early implementation of management skills with specialized care. Like literature search and reference quoted in this study we also observed similar findings about development of complications (Ascites, advance Child-Pugh score) that can be managed with early utilization of health care equipment. Magliocchetti et al¹⁸ observed in 1997 that greater blood transfusion, Child-Pugh score, older age are strong contributing factors of in hospital mortality in liver cirrhosis.

In our study we evaluated main predicting factors of in hospital mortality. In a study by Patch et al¹⁹ six main contributing factors were highlighted which include moderate to severe ascites, partial thromboplastin time, need for ventilation, raised creatinine level, white blood cell and platelet count.

Chronic liver disease is responsible for huge number of deaths worldwide. Ismail et al²⁰ reported 8.7% in hospital mortality in patients of chronic liver disease who were presented at emergency department of hospital with gastro-esophageal variceal bleeding. Older age, serum bilirubin, serum creatinine is concluded as contributing factors of sudden death in such patients. Intestinal endoscopy and re-bleed within 24 hours are independent factors of in hospital mortality.

CONCLUSION

Deranged serum creatinine, serum bilirubin, PSE and re-bleed within 24 hours of endoscopy were independent predictors of in hospital mortality. Aggressive control on laboratory and clinical values with latest innovative management is helpful in reduction of in hospital mortality.

Author's Contribution:

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Conflict of Interest: The study has no conflict of interest to declare by any author.

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