

# Factors Predicting In-Hospital Mortality in Patients with Liver Cirrhosis

Talha Rasheeq<sup>1</sup>, Muhammad Mumtaz Ather<sup>2</sup>, Malik Muhammad Arif<sup>3</sup>, Mehboob Qadir<sup>3</sup>, Humayun Riaz Khan<sup>3</sup> and Sheik Abdul Khaliq<sup>3</sup>

## ABSTRACT

**Objective:** To identify the independent predictors of in hospital mortality in gastro esophageal variceal hemorrhage in cirrhotic patients.

**Study Design:** Cross sectional

**Place and Duration of Study:** This study was conducted at the Gastroenterology department of Bakhtawar Amin Hospital and Nishtar hospital Multan from March 2018 to March 2019.

**Materials and Methods:** 250 patients were included in study. Laboratory and clinical parameters were assessed for their association with in hospital mortality. Laboratory parameters included were serum creatinine, serum bilirubin and clinical parameters were child pugh score, ascites and re-bleed within 24 hours of endoscopy. SPSS version 23 was used for data analysis.

**Results:** Hemoglobin (g/dL), prothrombin time, S. bilirubin (mg/dL), S. creatinine (mg/dL) and S. albumin (g/dL) of the survivors was observed as 4.9%, 7.6%, 4.9%, 8.9% and 2.7%, respectively. While, hemoglobin (g/dL), prothrombin time, S. bilirubin (mg/dL), S. creatinine (mg/dL) and S. albumin (g/dL) of the non-survivors was observed as 12%, 12%, 12%, 8% and 4% respectively. P value  $\leq 0.05$  was considered as significant.

**Conclusion:** Raised values of serum bilirubin, serum creatinine, re-bleeding within 24 hours of endoscopy and presence of PSE were the main independent predictors of in hospital mortality. Control of these parameters with advance management and specialized care is helpful to reduce in hospital mortality rate.

**Key Words:** Liver Cirrhosis, Gastro-esophageal variceas, in hospital mortality, Endoscopy, Serum creatinine.

**Citation of articles:** Rasheeq T, Ather MM, Arif MM, Qadir M, Khan HR, Khaliq SA. Factors Predicting In-Hospital Mortality in Patients with Liver Cirrhosis. Med Forum 2019;30(6):40-43.

## INTRODUCTION

In patients of liver cirrhosis gastro esophageal variceal (GEV) hemorrhage as a result of portal hypertension is a major complication<sup>1</sup>. Incidence of gastro esophageal variceal hemorrhage is 30% in cirrhotic patients with approximately 90% bleeding episodes. As compare to other causes of gastrointestinal tract bleeding GEV hemorrhage is responsible for more mortality, morbidity and hospital cost<sup>2</sup>. About 50% of cirrhotic patients die within 6 weeks of first episode of variceal bleeding<sup>3</sup>.

Esophageal varices occur when blood flow to liver with normal vessels blocked by a scar or clot. To overcome this blockage blood flows through smaller vessels but

can't fulfill the requirement of large volume due to their diameter insufficiency. As a result of this blockage rupture of the vessels may occur causing life threatening blood loss or death<sup>4,5</sup>.

Because of innovation in management of GEV hemorrhage mortality rate decreased to a significant range<sup>6</sup>. Patients of GEV hemorrhage advanced child pugh score, old age, rebleeding in earlier time after endoscopy, hepatocellular carcinoma, renal failure and encephalopathy are main contributing factor of mortality<sup>7</sup>. Prognosis of such type of patients is very slow but exact predicting prognosis varies according to different authors and their reports conducted in various regions<sup>8</sup>.

In Pakistani population chronic liver disease (CLD) increasing day by day and most common cause of hospital admission is GEV hemorrhage<sup>9</sup>. Along with hospital admissions CLD is huge economic burden on our health care system. In-hospital mortality in Pakistan is 8-50%, a very high rate as compare to any developing country in region<sup>10</sup>.

Aim of this study is investigate the predicting factors of mortality in cirrhotic patients admitted in hospital with GEV hemorrhage.

## MATERIALS AND METHODS

After permission from the hospital ethical board study was completed gastroenterology department of

<sup>1</sup>. Department of Medicine / Gastroenterology<sup>2</sup>, Bakhtawar Amin Medical & Dental College Multan.

<sup>3</sup>. Department of Medicine, Nishtar Medical University Multan.

Correspondence: Dr Talha Rasheeq, Assistant Professor of Medicine, Bakhtawar Amin Medical & Dental College Multan.

Contact No: 0300 9638881

Email: taalharasheeq@gmail.com

Received: April, 2019

Accepted: May, 2019

Printed: June, 2019

Bakhtawar Amin Hospital and Nishtar hospital Multan in one year duration from 15 March 2018 to 15 March 2019. Patients were included in the study after detail information to patients and obtaining a written consent. Non probability consecutive sampling was used for collection of data. Adult patients of age more than 14 years and who were presented and admitted with GEV hemorrhage due to chronic liver disease were included in the study.

Patients of GEV hemorrhage were admitted in high dependency unit where all kind of necessary monitoring like hemodynamic was available along with highly trained nurses and doctors. Endoscopy was available 24 hours. Vasoconstrictors like octeriotides and terlipressin were also available. Variceal band ligation was treatment of choice in these patients with good visibility. Re-endoscopy was done in patients with frank hematemesis, significant rebleed, fresh bleeding in nasogastric tube, malena and hemodynamically unstable patients (drop of >2 mg/dl hemoglobin).

Complete assessment of patients was done by a surgical team and surgical intervention was done in needed patients. surgical intervention criteria may included re bleed after two episodes of endoscopy. transjugular intrahepatic portasystemic shunt (TIPSS) was performed in patients who were on high risk of surgical intervention. Clinical and laboratory investigation were correlated with mortality and rebleed within 24 hours of endoscopy was assessed. Main laboratory parameters assessed were hemoglobin concentration, serum bilirubin, serum albumin, prothrombin time and serum creatinine.

Liver biopsy, biochemical parameters and imaging investigations were used for diagnosis of CLD. Patients were labeled as HCC positive when space occupying lesion is present on ultrasound; serum alpha fetoprotein level was raised and liver biopsy report. Grading of ascites was also done as "absent" easily controlled and "tense". When it was controlled with diuretics it was labeled as easily controlled and tense when associated with abdominal and respiratory distress.

Collected data was analyzed by using SPSS version 23, mean and standard deviation was calculated for numerical data like age and frequency percentages were calculated for categorical data like gender, presence of portosystemic encephalopathy, presence of ascites, Child-Pugh class, cirrhosis with HCC and PVT, cirrhosis with portal vein thrombosis [PVT], cirrhosis with hepatocellular carcinoma [HCC] and cirrhosis alone. Test of significance (t-test and chi square test were applied). P value  $\leq 0.05$  was considered as significant.

## RESULTS

Two hundred and thirty patients were included in this study, both genders. The patients were divided into two groups as survivors n=115 (50%) and n=115 (50%)

non-survivors. The mean age of the survivors was  $42.21 \pm 3.32$  years. There were n=149 (66.2%) males and n=76 (33.8%) females. The mean age of the non-survivors was  $40.23 \pm 3.99$  years. There were n=20 (80%) males and n=5 (20%) females. Diagnosis, child-pugh class, ascites and PSE was presented in table I. No significant difference was found except re-bleeding within 24 hours (p=0.000). (Table. I).

Hemoglobin (g/dL), prothrombin time, S. bilirubin (mg/dL), S. creatinine (mg/dL) and S. albumin (g/dL) of the survivors was observed as n=11 (4.9%), n=17 (7.6%), n=11 (4.9%), n=20 (8.9%) and n=6 (2.7%), respectively. While, hemoglobin (g/dL), prothrombin time, S. bilirubin (mg/dL), S. creatinine (mg/dL) and S. albumin (g/dL) of the non-survivors was observed as n=3 (12%), n=3 (12%), n=3 (12%), n=2 (8%) and n=1 (4%), respectively.(Table. II).

**Table No. I: Clinical variables at time of admission in both groups**

Variable	Survivors n=225	Non- survivors n=25	P- value
Age (years)	42.21±3.32	40.23±3.99	0.921
Gender			
Male	n=149 (66.2%)	n=20 (80%)	0.163
Female	n=76 (33.8%)	n=5 (20%)	
Diagnosis			
Cirrhosis alone	n=167 (74.2%)	n=21 (84%)	0.283
Cirrhosis + HCC	n=50 (22.2%)	n=6 (24%)	0.840
Cirrhosis + PVT	n=15 (6.7%)	n=2 (8%)	0.802
Cirrhosis + HCC + PVT	n=5 (2.2%)	n=2 (8%)	0.097
Child-Pugh class			
A	n=29 (12.9%)	n=4 (16%)	0.663
B	n=41 (18.2%)	n=7 (28%)	0.239
C	n=154 (68.4%)	n=18 (72%)	0.716
Ascites			
Absent	n=54 (24%)	n=6 (24%)	1.0
Easily controlled	n=154 (68.4%)	n=16 (68%)	0.651
Tense	n=14 (6.2%)	n=3 (12%)	0.276
PSE			
Absent	n=196 (87.1%)	n=24 (96%)	0.194
Stage 1 or 2	n=27 (12%)	n=5 (20%)	0.256
Stage 3 or 4	n=16 (7.1%)	n=2 (8%)	0.870
Re-bleeding within 24 h	n=19 (8.4%)	n=14 (56%)	0.000

**Table No.2: Laboratory parameters at time of admission in both groups**

Variable	Survivors n=225	Non- survivors n=25	P- value
Hemoglobin (g/dL)	n=11 (4.9%)	n=3 (12%)	0.142
Prothrombin time (s)*	n=17 (7.6%)	n=3 (12%)	0.437
S. bilirubin (mg/dL)	n=11 (4.9%)	n=3 (12%)	0.142
S. creatinine (mg/dL)	n=20 (8.9%)	n=2 (8%)	0.882
S. albumin (g/dL)	n=6 (2.7%)	n=1 (4%)	0.701

## DISCUSSION

Gastrointestinal bleeding in patients with chronic liver disease and portal hypertension is major cause of in hospital mortality, latest modalities including prophylactic antibiotics, terlipressin, variceal band ligation and TIPSS in management of GEV hemorrhage reduce the rate of in hospital mortality<sup>11</sup>. Mortality rate at our hospital is consistent in comparison to other hospital of region.

Pauwels et al<sup>12</sup> conducted a study in 1998 and reported that in hospital mortality rate decreased about 50% in last 15 years in cirrhotic patients who were admitted in hospital with variceal bleeding. This is only because of advances in management of bleeding factors and early availability of specialized care. A similar study was conducted by Chojkier et al<sup>13</sup> and reported 35% bleeding related in hospital mortality in cirrhotic patients. This study can be compared our study.

Another study was conducted by Afessa et al<sup>14</sup> in 2000 on investigation of frequency of in hospital mortality of cirrhotic patients presented with GEV hemorrhage. He reported 21% mortality rate which is too much improved percentage from last few years. Chalasani et al<sup>15</sup> also conducted a similar study and reported 14.2% mortality rate in cirrhotic bleeding patients, a much improved proportion due to early and advance care of such patients.

Decrease in mortality rate in world shows control on disease and research work of health profession to overcome diseases and associated hazards. Similar study was conducted by Del Olmo et al<sup>16</sup> on a large sample of cirrhotic patients presented with GEV hemorrhage and reported more declined proportion of 7.4%. in his study he also reported that deranged laboratory values like serum creatinine, serum bilirubin after endoscopy are also independent factors of mortality of patients. In our study we also investigate this variable.

Carbonell et al<sup>17</sup> conducted a study in 2004 and reported a similar finding that survival rate from in hospital mortality is improved to a significant range

from last two decades. A small proportion of mortality was reported in his study just because of advancement in management system and early availability of specialized care. In 1997 Magliocchetti et al<sup>18</sup> conducted a study on this topic and concluded that advance age, child pugh score, greater transfusions are also striking associated factors of mortality in cirrhotic patients.

Similarly Patch et al<sup>19</sup> reported 6 contributing factors of mortality in cirrhotic patients presented with GEV bleeding. These factors include partial thromboplastin time, moderate to severe ascites, creatinine, need for ventilation, platelet count and white blood cell count. In our study we also investigate these contributing factors and reported similar findings.

In a study conducted by Ismail et al<sup>20</sup> reported 8.7% in hospital mortality rate in patients of chronic liver disease who were admitted with gastro-esophageal variceal hemorrhage. He also concluded serum creatinine, serum bilirubin are contributing factors along advance age. Sudden increase of these values after endoscopy is responsible for death. Re-bleed within 24 hours of intestinal endoscopy also an independent factor of mortality.

## CONCLUSION

Raised values of serum bilirubin, serum creatinine, re-bleeding within 24 hours of endoscopy and presence of PSE were the main independent predictors of in hospital mortality. Control of these parameters with advance management and specialized care is helpful to reduce in hospital mortality rate.

### Author's Contribution:

Concept & Design of Study:	Talha Rasheeq
Drafting:	Muhammad Mumtaz Ather, Malik Muhammad Arif
Data Analysis:	Mehboob Qadir, Humayun Riaz Khan and Sheik Abdul Khaliq
Revisiting Critically:	Talha Rasheeq, Muhammad Mumtaz Ather
Final Approval of version:	Talha Rasheeq

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

## REFERENCES

- Moore BJ, White S, Washington R, Coenen N, Elixhauser A. Identifying Increased Risk of Readmission and In-hospital Mortality Using Hospital Administrative Data. *Med Care* 2017; 55(7):698-705.
- González-González JA, García-Compean D, Vázquez-Elizondo G, Garza-Galindo A, Jáquez-

- Quintana JO, Maldonado-Garza H. Nonvariceal upper gastrointestinal bleeding in patients with liver cirrhosis. Clinical features, outcomes and predictors of in-hospital mortality. A prospective study. *Ann Hepatol* 2011;10(3):287-95.
3. Freund Y, Lemachatti N, Krastinova E. Prognostic Accuracy of Sepsis-3 Criteria for In-Hospital Mortality Among Patients With Suspected Infection Presenting to the Emergency Department. *JAMA* 2017;317(3):301–308.
  4. Hutchinson JP, Fogarty AW, McKeever TM, Hubbard RB. In-Hospital Mortality after Surgical Lung Biopsy for Interstitial Lung Disease in the United States. 2000 to 2011. *Am J Respir Crit Care Med* 2016;193(10):1161-7.
  5. Hutchinson J, Fogarty A, Hubbard R, McKeever T. Global incidence and mortality of idiopathic pulmonary fibrosis: a systematic review. *Eur Respir J* 2015;46:795–806.
  6. Raith EP, Udy AA, Bailey M. Prognostic Accuracy of the SOFA Score, SIRS Criteria, and qSOFA Score for In-Hospital Mortality Among Adults With Suspected Infection Admitted to the Intensive Care Unit. *JAMA* 2017;317(3):290–300.
  7. Tandon P, Reddy KR, O'Leary JG, Garcia-Tsao G, Abraldes JG, Wong F, et al. A Karnofsky Performance Status–Based Score Predicts Death After Hospital Discharge in Patients With Cirrhosis. *Hepatology* 2017;65(1):217-24.
  8. Bajaj JS, Reddy KR, Tandon P, Wong F, Kamath PS, GarciaTsao G, et al. The three-month readmission rate remains unacceptably high in a large North American cohort of patients with cirrhosis. *Hepatology* 2016;64:200-208.
  9. Tapper EB, Su GL. Does Karnofsky Performance Status of patients with cirrhosis on the transplant waitlist meet the eyeball test? *Clin Gastroenterol Hepatol* 2016;14:1196-1198.
  10. Orman ES, Ghabril M, Chalasani N. Poor performance status is associated with increased mortality in patients with cirrhosis. *Clin Gastroenterol Hepatol* 2016;14:1189-1195.
  11. El-Serag HB, Everhart JE. Improved survival after variceal hemorrhage over an 11-year period in the Department of Veterans Affairs. *Am J Gastroenterol* 2000;95:3566-73.
  12. Pauwels A, Fourdan O, Carbonell N. Mortality from digestive hemorrhage for the last fifteen years. *Gastroenterol Clin Biol* 1998;22:(Suppl 2): A27.
  13. Chojkier M, Laine L, Conn HO, Lerner E. Predictors of outcome in massive upper gastrointestinal hemorrhage. *J Clin Gastroenterol* 1986;8:16-22.
  14. Afessa B, Kubilis PS. Upper gastrointestinal bleeding in patients with hepatic cirrhosis: clinical course and mortality prediction. *Am J Gastroenterol* 2000;95:484-9.
  15. Chalsani N, Kahi C, Francois F, Pinto A, Marathe A, Bini EJ, et al. Improved patient survival after acute variceal bleeding: a multicenter, cohort study. *Am J Gastroenterol* 2003;98:653-9.
  16. Del Olmo JA, Pena A, Serra MA. Predictors of morbidity and mortality after the first episode of upper gastrointestinal bleeding in liver cirrhosis. *J Hepatol* 2000;32:19-24.
  17. Carbonell N, Pauwels A, Serfaty L, Fourdan O, Levy VG, Poupon R. Improved survival after variceal bleeding in patients with cirrhosis over the past two decades. *Hepatology* 2004;40:652-9.
  18. Magliocchetti N, Torchio P, Corrao G, Arico S, Favilli S. Prognostic factors for long-term survival in cirrhotic patients after the first episode of liver decompensation. *Ital J Gastroenterol Hepatol* 1997; 29:38-46.
  19. Patch D, Nikolopoulou V, McCormick A, Dick R, Armonis A, Wannamethee G. Factors related to early mortality after TIPS for failed endoscopic therapy in acute variceal bleed. *J Hepatol* 1998; 28:454-60.
  20. Ismail FW, Mumtaz K, Shah HA. Factors predicting in-hospital mortality in patients with cirrhosis hospitalized with gastro-esophageal variceal hemorrhage. *Indian J Gastroenterol* 2006; 25:240-43.