



CODEN [USA]: IAJ PBB

ISSN : 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187

<http://doi.org/10.5281/zenodo.4243666>
Available online at: <http://www.iajps.com>

Research Article

DETERMINATION OF THE FACTORS INFLUENCING THE OUTCOME OF HOSPITALIZATION IN PATIENTS SUFFERING FROM LIVER CIRRHOSIS

¹Dr Syed Abid Mehdi Kazmi, ²Dr Naheed Sana, ³Dr Muhammad Qamar Nazeer
¹Ziauddin Hospital Karachi, ²RHC Kamar Mashani, ³DHQ Hospital Chiniot.

Article Received: September 2020 Accepted: October 2020 Published: November 2020

Abstract:

Objectives: To find out the different factors influencing the outcome of hospitalization among patients suffering from liver cirrhosis who got admission in our hospital.

Methodology: This study was conducted at Ziauddin hospital Karachi. we collected the data of the patients of liver cirrhosis with more than 12 years of age who got admission in our hospital from May 2019 to April 2020 with the utilization of purposive sampling. We noted down the outcome of the hospitalization in term of "Death" & "No death". We used the SPSS V.23 for the statistical analysis of the collected information. We performed the bivariate analysis & logistic regression analysis for ascertaining the impacts of various predictors like sex, age, past history of DM (Diabetes Mellitus), cirrhosis's etiology, availability of hepatic encephalopathy at the time of appearance, presence of upper gastro-intestinal bleed and trachea-bronchial aspiration on the probability that death would be the final outcome among the patients suffering from liver cirrhosis.

Results: Among a sum of total 1000, 13.50% patients died in the duration of hospitalization. The average age of died patients was 36.06 ± 12.27 years. Bivariate analysis proposed that rate of mortality was much high in the patient's groups who were present with hepatic encephalopathy at the time of presentation ($P < 0.010$), no upper GI bleed ($P < 0.010$) and patients who obtained tracheobronchial aspiration in the duration of hospitalization ($P < 0.010$). There was no difference in this rate both genders ($P = 0.3020$), diabetic group & non-diabetic group ($P = 0.4320$), with non-viral/viral etiology of liver cirrhosis ($P = 0.7160$). Logistic regression analysis showed that patients who were present with trachea-bronchial aspiration were 10.170 times more likely to meet their death than the patients who were present without trachea-bronchial aspiration. In the same manner, patients present with hepatic encephalopathy were 5.640 times more likely to be died who had no hepatic encephalopathy.

Conclusion: Inpatient rate of mortality in the patients of liver cirrhosis was much high. Sex, age, past history of DM, viral etiology of liver cirrhosis did not take part in this high rate of mortality. The patients presented with hepatic encephalopathy and the patients suffering from trachea-bronchial aspiration in the duration of hospitalization were more expected to die.

Keywords: Mortality, Cirrhosis, Hepatic, Trachea, Hospitalization, Outcome.

Corresponding author:

Dr. Syed Abid Mehdi Kazmi,
Ziauddin Hospital Karachi.

QR code



Please cite this article in press Syed Abid Mehdi Kazmi *et al*, *Determination of the factors influencing the Outcome of hospitalization in patients suffering from liver cirrhosis.*, *Indo Am. J. P. Sci*, 2020; 07(11).

INTRODUCTION:

Liver cirrhosis is much vital issue of public health in Pakistan [1]. The most common etiology of the liver cirrhosis is the HCV infections in this region [2]. The range of its world-wide incidence is from 2.30% to 7.30% [3]. Different causes of hospitalization of the patients of liver cirrhosis include multiple complications of this particular disease as UGIB (Upper GI bleed) [4], HE (Hepatic Encephalopathy) [5]. Hospitalization's outcome of these patients in term of their death or recovery is not satisfactory. In-hospital rate of mortality in the patients suffering from liver cirrhosis is very high in the whole world, having a range from 11.30% to 13.0% [6, 7]. In the past, various prognostic models [8] like the CTP (Child-Turcotte-Pugh) scoring system and MELD (Model for End-Stage Liver Disease) had been framed for the end-stage liver diseases. Still, there is poor understanding of the factors associated with the hospital and patients. If there is finding of some etiological factors in our setups then there can be reduction of mortality rate with adopting preventive measures and it will improve the outcome of hospitalization. The objective of this research work was to find out the factors influencing the hospitalization's outcome in the patients of liver cirrhosis.

METHODOLOGY:

This study was conducted at Ziauddin hospital Karachi and the duration of this study was from May 2019 to April 2020. Ethical committee of the hospital gave the permission to conduct this research work. We obtained the written consent from all the patients after explaining them the purpose of this research work. The calculation of the sample size was carried out with the utilization of the online Rao-soft calculator. We gathered the data prospectively with the utilization of purposive sampling method. All the patients with confirmed chronic liver complication having age more than twelve years who got admission in the hospital because of various complications linked with liver cirrhosis were the participants of this research work.

We also noted the hospitalization's outcome in terms of "Death" & "No death". Other group consisted the patients who obtained discharge, referred to other hospitals or leaved without any medical advice. We labelled the pulmonary aspiration [10] after detecting tachypnea, crackles on examination of chest and wheeze.

SPSS V.23 was used for the statistical analysis of the collected information. Patient's age was the single quantitative variable, whereas gender, past history of DM, etiology of liver cirrhosis in term of non-viral/viral, presence UGIB, hepatic encephalopathy at the time of appearance & trachea-bronchial aspiration were qualitative variables. We expressed the continuous data in mean and standard deviations. We expressed the categorical variables in frequencies & percentages. Bivariate analysis was carried out to determine the predictors of high rate of mortality in the patients of liver cirrhosis with the utilization of Chi-square test. P value of less than 0.050 was considered as significant. We also performed the binary logistic regression analysis to ascertain the impact of various predictors on likelihood that mortality would be the hospitalization's outcome in the patients of liver cirrhosis.

RESULTS:

Among total 1000 patients of liver cirrhosis, 13.50% (103) patients died whereas 62.10% (897) did not die in the duration of hospitalization. The average age of the patients who died was 36.06 ± 12.27 years and average age of the patients remained safe from death were 31.63 ± 12.17 years. Average difference of hospitalization's outcome who died and who survived because of liver cirrhosis is 2.110 and this is significant statistically ($P < 0.010$) (Table-1). Bivariate analysis stated that mortality rate was much high in the patients who were present with hepatic encephalopathy at the time of presentation ($P < 0.010$), UGIB ($P < 0.010$) and patients who got trachea-bronchial aspiration in hospitalization ($P < 0.010$).

Table-I: Comparison of Mean Age of Patients Suffering Liver Cirrhosis with Hospitalization Outcome (n =1000)

Outcome	Mean Age (Years)	SD	Mean	95% CI
Death	36.06	12.271		
No Death	31.63	12.171	2.016	2.111 – 4.141

Independent sample T-test was used.

There was no significant difference in both genders ($P=0.3020$), groups of diabetic/non-diabetics ($P=0.4320$), with etiology of viral/non-viral cirrhosis ($P=0.7160$) (Table-2).

Table-II: Factors Affecting the Outcome of Hospitalization in Patients Suffering Liver Cirrhosis (n = 1000)

Factors		Outcome of hospitalization		Total	p-
		Death	No Death		
Gender:	Male	33 (26.1%)	427 (26.0%)	430 (26.1%)	0.302
	Female	70 (31.5%)	470(30.0%)	570 (30.7%)	
Diabetes Mellitus:	Yes	27 (12.1%)	120(10.7%)	150 (11.1%)	0.430
	No	76 (63.7%)	777(65.1%)	850(64.7%)	
Etiology of cirrhosis	Viral	73 (62.2%)	727(83.9%)	850(62.0%)	0.716
	No-viral	30 (13.4%)	170(16.1%)	150 (14.0%)	
Hepatic encephalopathy at presentation	Yes	79 (46.6%)	131(11.7%)	272 (20.3%)	<0.01
	No	24 (11.0%)	766(64.1%)	728(55.3%)	
Presence of upper gastrointestinal bleed	Yes	30 (16.0%)	250 (20.7%)	307 (17.0%)	<0.01
	No	103 (60.0%)	647(35.1%)	693 (41.0%)	
Tracheobronchial Aspiration during hospitalization	Yes	57 (16.3%)	13 (1.2%)	72 (5.0%)	<0.01
	No	46 (41.3%)	884(76.4%)	928 (70.6%)	

*Chi-square test for independence was used.

We performed the logistic regression to ascertain the effects of age of patient, gender, past history of DM, etiology of liver cirrhosis, availability of hepatic encephalopathy at the time of presentation, presence of UGIB and trachea-bronchial aspiration on likelihood that death would be the hospitalization's outcome among the patients suffering from liver cirrhosis. We found the logistic regression model as significant statistically, $P < 0.050$. Table-3 is summarizing the whole scenario for the patients with trachea-bronchial aspiration and patients in hepatic encephalopathy (Table-3).

Table-III: Binary Logistic Regression Output with Co-Efficient, Odds Ratio and Their 95% CI.

Risk Factors	B	S.E.	Wald-Statistic	p-value	Odds Ratio	95% C.I. for EXP(B)	
						Lower	Upper
Age	-0.01	0.01	0.701	0.121	0.772	0.76	1.005
Gender (Male/Female)	-0.05	0.2	1.606	0.154	0.545	0.300	1.105
Diabetes mellitus (Yes/No)	0.115	0.24	1.424	0.177	1.200	0.615	2.120
Etiology of cirrhosis (Viral/non-viral)	-0.15	0.25	0.217	0.315	0.625	0.311	1.177
Hepatic encephalopathy at presentation (Yes/No)	2.040	0.23	44.316	<0.01	3.420	2.57	10.7
Upper gastrointestinal bleed (Yes/No)	0.131	0.24	1.611	0.156	1.201	0.631	2.16
Tracheobronchial aspiration (Yes/No)	2.315	0.12	32.403	<0.01	10.150	4.135	22.14
Constant	-1.61	0.41	6.165	<0.01	0.1421		

Nagelkerke R Square = 22.4%, Cox & Snell R Square = 16.6%.

DISCUSSION:

There is very high rate of inpatient mortality rate because of liver cirrhosis. In 2017, Cristal L. Brown in hid research work conducted in North Carolina, USA stated 13.50% inpatient mortality rate in the patients of liver cirrhosis. Similarly, Zubieta-Rodriguez in 2017 [11] from Colombia and Alsultan in 2011 [7]

from Saudi Arabia had stated 23.50% and 35.0% rate of mortality in the admitted patients of liver cirrhosis. In this current research work, we examined 15.72% rate of mortality in the hospitalized patients suffering from liver cirrhosis. There are multiple factors affecting the outcome of hospitalization in hospitalized patients suffering from liver cirrhosis.

Alsultan MA observed the adverse hospitalization outcome in the patients of cirrhosis who were present with worse CTP score, advance age and worse MELD score [7]. He also examined that advanced age ($P=0.004$) was an independent risk factor for high rate of mortality of the patients suffering from cirrhosis.

Similarly, Chen CY [12] discovered that age greater than 75 years was present with strong association to the in-hospital mortality. In this research work, the average age of the patients who died was much high as compared to the survived patients ($P<0.01$). It shows that advanced age is a serious risk factor of high rate of mortality in the patients of cirrhosis in whole world. In 2017, Bajaj JA [13] discovered that hepatic encephalopathy as most important determinant of high rate of mortality in the patients of cirrhosis. Tracheobronchial aspiration carries a mortality risk of thirty percent but it is preventable [14, 15]. A strong reason of the trachea-bronchial aspiration in patients of liver cirrhosis is high oral doses of lactulose managed to revert hepatic encephalopathy [16].

Tracheo-bronchial aspiration is detected during massive UGIB which can be secured with the help of intubating [17]. Some patients of liver cirrhosis exhibited aspiration during the endoscopic interventions which can be reduced by adequate preventive measures. Mortality because of complicate liver diseases is leading reason of death in our region [18]. In one other large research work on more than eight thousand patients showed the mortality rate of 3.31% patients. 140 deaths were the outcome of medical causes. Among these medical patients, 20.40% (33) patients died of chronic liver complication [19]. One other research work showed that there was 3.95% rate of mortality. Among them 74.65% deaths were outcomes of different medical reasons and 10.24% deaths were because of chronic liver disease.

CONCLUSION:

The rate of mortality in the patients of liver cirrhosis was much high. Sex, age of the patients, past history of DM and viral etiology of the liver cirrhosis did not take part significantly in increasing the mortality rate of these patients. All the patients who appeared with the hepatic encephalopathy and the patients who were suffering from trachea-bronchial aspiration in the duration of hospitalization were more probable to die. Excellence in the management of the hepatic encephalopathy and deterrence from aspiration can efficiently decrease the rate of mortality of the patients of liver cirrhosis in our institutes.

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