

# FACTORS ASSOCIATED WITH DEATH AND DURATION OF STAY OF CIRRHOTIC PATIENTS ADMITTED IN THE HEPATO-GASTROENTEROLOGY UNIT OF LOMÉ CAMPUS TEACHING HOSPITAL (TOGO)

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## ABSTRACT

**Background:** In Togo, the death rate for cirrhosis was estimated at 33.4%. The purpose of this study was to identify the factors associated with the duration of stay and death of cirrhotic patients hospitalized in the hepato-gastroenterology department.

**Patients and method:** A retrospective, descriptive and analytical cross-sectional study was conducted from January 1, 2005 to December 31, 2014 in the Hepato-gastroenterology unit of the Teaching Hospital of Lomé. In-patient records during the study period for cirrhosis and its complications were included. The probability of survival was determined by the Kaplan-Meier method.

**Results:** We enrolled 2152 hospitalized cirrhotic patients during the study period, including 1447 men (67.2%) and 705 women (32.8%). The median age was 48 years. There were 567 deceased patients (26.3%). The median duration of stay was 7 days. Death occurred in 64.4% of cases in the first week of hospitalization ( $p < 0.001$ ). Hepatocellular carcinoma, oedemato-ascitic decompensation, jaundice and gastrointestinal bleeding were the complications significantly associated with death. The Child-Plugh-Turcott C score was significantly associated with death ( $p < 0.001$ ). In the event of death, the median duration of stay was 1.5 days for patients with hepatic encephalopathy; it was 6 days in case of ascites. The probability of overall survival at the first day of hospitalization was 94.1%; it decreased to 23% by the 40th day. Survival was significantly associated with the Child Plugh Turcott score ( $p < 0.001$ ). Hepatic encephalopathy had a 5.2-fold higher risk of death than oedemato-ascitic decompensation.

**Conclusion:** The majority of cirrhotic patients hospitalized a Child Pugh score stages B and C; more than half of the deaths occurred in the first week of hospitalization.

**Keywords :** Cirrhosis, Death, Survival, Togo

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## INTRODUCTION

Cirrhosis is defined histologically by annular fibrosis associated with regenerative nodules, resulting in a deformation of the liver architecture<sup>1</sup>. It is a real public health problem in Africa; mortality due to cirrhosis and its complications was estimated at 42.3% in Benin while it was 31.5% in Côte d'Ivoire<sup>2,3</sup>. In Togo, the death rate for cirrhosis was estimated at 33.4% in the hepato-gastroenterology unit of the Teaching Hospital of Lomé<sup>4</sup>. Bouglouga *et al* reported a 25% death rate related to gastrointestinal bleeding by rupture of oesophageal varices<sup>5</sup>. The purpose of this study was to identify the factors associated with the duration of stay and death of cirrhotic patients hospitalized in the hepato-gastroenterology department.

## PATIENTS AND METHODS

A retrospective, descriptive and analytical cross-sectional study was conducted from January 1, 2005 to December 31, 2014 in the Hepato-gastroenterology unit of the Teaching Hospital of Lomé. In-patient records during the study period for cirrhosis and its complications were included. The demographic (age, sex), clinical (reason for admission, complications of cirrhosis, Child-Plugh-Turcott score, HIV status) and progressive (death or patients discharge, length of stay) data were studied. The data were collected on a survey card, entered and saved in a database designed under Microsoft Office Excel 2010. Before being analyzed, the computer data was verified and cleared. Statistical analysis was performed with R version 3.3.2 software. In terms of descriptive analysis, the results were expressed in terms of size and percentage for qualitative variables or median and interquartile range (IQR) for quantitative variables. The probability of survival was determined by the Kaplan-Meier method. A comparative analysis was carried out to find a difference between the variables collected according to the evolution of cirrhosis (deceased and the living ones). For survival analysis: the event studied was death at the end of the hospital stay. The duration of stay of patients was expressed in days. It corresponded to the difference between the date of entry into the unit and the date of death. We used survival data analysis to describe the occurrence of death in the study population and then in each group (complications) and the Log-Rank test was used to compare patient

survival curves. The association of the different variables with death has been studied with the proportional hazards model of Cox. A uni-variable Cox model was used to study the association between death and explanatory variables (complications). The statistical tests used were the Pearson Chi-square test or the Fisher exact test for qualitative variables and the Student's test for quantitative variables. The threshold of significance was set at 0.05.

## RESULTS

We enrolled 2152 hospitalized cirrhotic patients during the study period, including 1447 men (67.2%) and 705 women (32.8%). The median age was 48 years with an IQR of 38 to 59 years. There were 567 deceased patients (26.3%). The median duration of stay was 7 days with an IQR of 3 to 11 days. Death occurred in 64.4% of cases in the first week of hospitalization ( $p < 0.001$ ). The death rate was significantly high in subjects over 48 years of age ( $p = 0.026$ ). There were more deaths in male than in female cirrhotic patients, but not statistically significant ( $p = 0.151$ ). Abdominal pain, ascites, impairment of general condition were significantly associated with death ( $p = 0.0037$ ) (Table 1).

Hepatocellular carcinoma, oedema, ascites, jaundice and gastrointestinal bleeding were the complications significantly associated with death. The Child-Plugh-Turcott score stage C was significantly associated with death ( $p < 0.001$ ). In the event of death, the median duration of stay was 1.5 days for patients with hepatic encephalopathy, infections (2 days), gastrointestinal bleeding (2 days); 6 days in case of ascites, renal impairment (6 days), and jaundice (5 days), hepatocellular carcinoma (5 days) (Table 2). The probability of overall survival at the first day of hospitalization was 94.1%; this probability decreased to 72.3% by the 10th day, 23% by the 40th day (Figure 1).

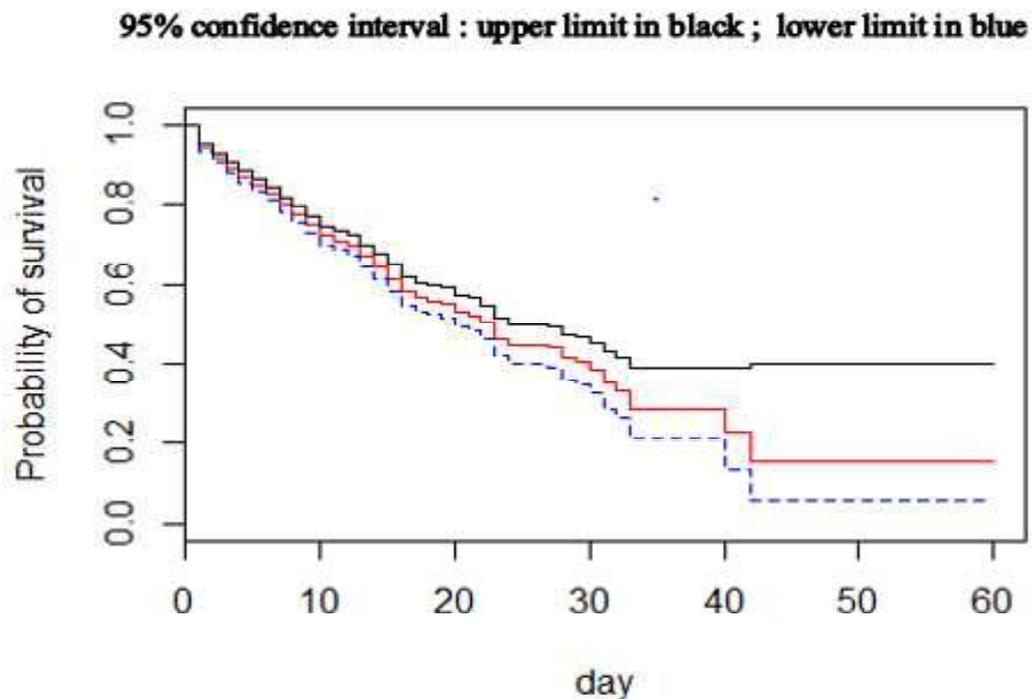
Survival was significantly associated with the Child Plugh Turcott score ( $p < 0.001$ ). Patients with a Child Plugh Turcott score stage C had a lower probability of survival (Figure 2). Survival was not significantly associated with sex ( $p = 0.383$ ) and HIV status ( $p = 0.162$ ). Hepatic encephalopathy had a 5.2-fold higher risk of death than oedemato-ascitic decompensation as shown in Table 3.

**Table 1 :** Demographic characteristics and outcome in patients with liver cirrhosis

	Survivor (n=1585)		Deceased (n=567)		P
	n	%	n	%	
<b>Gender</b>					0.151
Male	1052	66.4	395	69.7	
Female	563	33.6	172	30.3	
<b>Age (years)</b>					
Mean (Standard deviation)	48.1 (15.1)		50.1 (14.8)		0.0054
Age groups in quartiles					0.026
[14-38]	447	28.2	125	22.1	
[39-48]	386	24.4	156	27.5	
[49-59]	376	23.7	134	23.6	
[60-106]	376	23.7	152	26.8	
<b>HIV* status</b>					0.182
Negative	1546	97.5	547	96.5	
Positive	39	2.5	20	3.5	
<b>Duration of stay (days)</b>					<0.001
[0-7**]	853	53.8	365	64.4	
[8-62]	732	46.2	202	35.6	

\*Human immunodeficiency virus

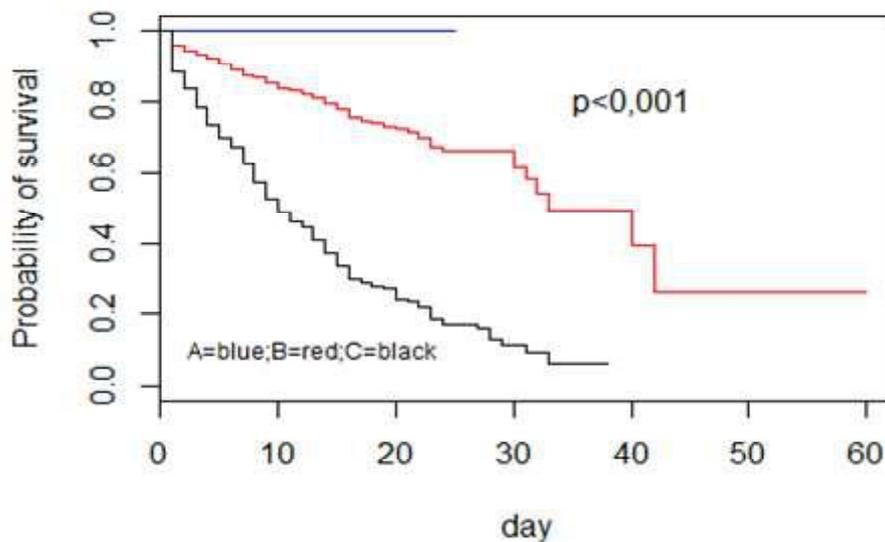
\*\*Median duration of stay



**Fig. 1:** Overall survival of the study population

**Table 2:** Indications for admission, complications, and etiology of cirrhosis

	Survivor		Deceased		P
	n	%	n	%	
<b>Indications for admission</b>					
Impairment of general condition	64	4	31	5.5	0.0037
Ascites	420	26.5	130	22.9	
Abdominal pain	272	17.2	109	19.2	
Gastrointestinal bleeding	157	9.9	39	6.9	
Ascites/Jaundice/ Oedema of the lower limbs	672	42.4	258	45.5	
<b>Complications of cirrhosis</b>					
Ascites	691	43.5	220	38.8	<0.001
Hepatic encephalopathy	9	0.6	16	2.8	
Jaundice	106	6.7	44	7.8	
Infections	20	1.3	3	0.5	
Hepatocellular carcinoma	587	37	246	43.4	
Renal impairment	22	1.4	5	0.9	
Gastrointestinal bleedings	150	9.5	33	5.8	
<b>Child-Plugh-Turcott Score</b>					
A	310	19.6	0	0	<0.001
B	948	59.8	183	32.3	
C	327	20.6	384	67.7	
<b>Etiologies</b>					
Hepatitis B virus	589	37.2	301	53.1	<0.001
Hepatitis C virus	380	23.9	0	0	
Unknown	425	26.8	260	45.8	
Alcohol	191	12.1	6	1.1	



**Fig. 2:** Survival according to Child Pugh Turcott score

**Table 3 :** Univariate analysis of the survival according to complications of cirrhosis (Model of Cox)

	Hazard ratio	P
Oedemato-ascitic decompensation	1	
Hepatic encephalopathy	5.23774	<0.001
Jaundice	1.35971	0.0631
Infections	0.63882	0.4409
Hepatocellular carcinoma	1.52055	<0.001
Renal impairment	0.85193	0.7232
Gastrointestinal bleedings	0.85863	0.4151

encephalopathy in our study was the use of lactulose associated with antibiotics. None of our patients had an elastic ligation of oesophageal varices in case of gastrointestinal bleedings. Paracentesis was the main treatment in cases of ascites.

## DISCUSSION

In our study, death was more common in men than in women; similarly, the death rate was significantly high in subjects over 48 years of age. This observation was also made in Benin where Sehonou *et al* linked this fact to the high frequency of alcohol consumption among men<sup>2</sup>. Death occurred in more than half of the cases in the first week of hospitalization ( $p < 0.001$ ). This finding could be explained by the advanced state of cirrhosis before hospitalization<sup>6</sup>; indeed 67.7% of cirrhotic deaths had a Child Pugh score stage C, consistent with a poor prognosis ( $p < 0.001$ ). Cirrhotic patients are usually hospitalized only at a late stage of their illness; the diagnosis is therefore late and the preventive treatments often illusory<sup>7</sup>. In the study by Bathaix, *et al*, the parameters significantly associated with a poor prognosis were: hepatic encephalopathy, spontaneous ascites fluid infection, hyponatremia, renal impairment and Child Pugh score stage C. Diuretics in-take significantly improved survival; the occurrence of hepatic encephalopathy reduced survival<sup>6</sup>. This is consistent with Bustamante study that showed that hepatic encephalopathy was responsible for a high rate of cirrhotic death<sup>8</sup>. This finding was observed in our study, where death occurred in the first 48 hours in cases of hepatic encephalopathy, infections and gastrointestinal bleeding.

In this study, none of our patients had an elastic ligation of oesophageal varices due to lack of

material. In a previous study conducted in the same department, Bouglouga, *et al* found that blood transfusion in case of gastrointestinal bleeding did not improve the prognosis of the patients<sup>5</sup>. Hepatic encephalopathy had a 5.2-fold higher risk of death than oedemato-ascitic decompensation and a short median duration of stay (1.5 days). The main treatment in case of hepatic encephalopathy in our study was the use of lactulose associated with antibiotics. The advanced state of liver disease on the one hand and the lack of a real intensive care unit in the hepato-gastroenterology department may explain this fact. In our study, like those of Bathaix *et al* in Côte d'Ivoire and Sehonou *et al* in Benin, ascites was the main complication and was associated with a poor prognosis<sup>5,6</sup>. About 60% of cirrhotics will develop ascites after 10 years; which is an indicator of poor prognosis with a death rate of nearly 40% one year after its occurrence<sup>9-14</sup>. In the event of death, ascites caused a long period of stay, as did renal impairment; renal impairment has been described in the literature as a reducing factor of survival in cirrhotic patient<sup>15</sup>.

Paracentesis was the main treatment in case of oedemato-ascitic decompensation. The Child Pugh C score was associated with a lower probability of survival; it is an independent factor that predisposes the patient to death<sup>16,17</sup>. Hepatitis B virus was the main virus implicated in the occurrence of cirrhosis; this could be higher if all patients had been evaluated for viral markers that were relatively expensive; the etiology of cirrhosis was not specified in nearly a third of the cases in our study. Hepatocellular carcinoma was the first cause of cirrhotic death, hence the importance of stressing the fight against its risk, especially viral hepatitis B and C, and informing cirrhotic patients about the need for medical follow-up to detect hepatocellular

carcinoma at an early stage. A study in the department noted that hepatocellular carcinoma was caused in 22% of the hepatitis B virus<sup>18</sup>. The absence of data on some factors such as hyponatremia and ascites fluid infection has not made it possible to evaluate in our work the impact of these parameters on survival. Hyponatremia is a factor of poor prognosis and reduces the survival of cirrhotic patients<sup>15</sup>. In Côte d'Ivoire, ascites fluid infection is the leading cause of cirrhotic death<sup>19</sup>.

## CONCLUSION

The majority of cirrhotic patients hospitalized in the hepato-gastroenterology unit of the Teaching Hospital of Lomé had a Child Pugh score stages B and C (poor prognosis); that could explain early death. More than half of the deaths occurred in the first week of hospitalization. Oedema, ascites, renal impairment and hepatocellular carcinoma were the main complications that led to a long hospital stay. Strengthening the technical unit could improve the management of cirrhosis in Togo.

**Conflict of Interest :** Authors do not declare any conflict of interest

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