Open Journal of Gastroenterology, 2015, 5, 103-109
Published Online July 2015 in SciRes. http://www.scirp.org/journal/ojgas
http://dx.doi.org/10.4236/ojgas.2015.57017

Prognostic Factors for Cirrhosis Hospital in Abidjan (Côte d'Ivoire)

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Received 17 June 2015; accepted 20 July 2015; published 23 July 2015

Abstract

Cirrhosis is the cause of a high rate of death in hospitals. The aim of this research was to estimate the incidence of mortality and identify the risk factors associated with cirrhosis patients in hospital in Côte d'Ivoire. Methodology: It is a retrospective study covering from January 1st, 2002 to December 31st, 2011 at Centre Hospitalier et Universitaire de Yopougon in Abidjan. We concerned the cirrhosis patients that have been followed at the hepatology and gastroenterology department. Survival was estimated by the Kaplan-Meier curve and comparison of survival curves by the log-rank test. The multi-varied analysis of the survivals has been achieved with the Cox proportional Hazard regression. A p value < 0.05 was taken as significant. Results: We recruited, 221 patients (135 men) of whom the medium age was 59 ± 15.12 years. Among those patients, 34.5% were classified as Child Pugh C and 52.94% Child Pugh B, 19.45% suffered from digestive hemorrhage, 26.5% suffered from renal deficiency, 47% suffered from hepatic encephalopathy and 10.7% from hyponatremia. The median overall survival of patients was 0.50 person-months. The variables that were significantly associated to a reduction of survival were hepatic encephalopathy (p = 0.0029), spontaneous ascitesfluid infection (p = 0.0208), hyponatremia (p = 0.0434) and stage Cof Child-Pugh score (p = 0.046). Conclusion: The incidence of mortality in cirrhotic patients hospitalized in Abidjan is high. Pejorative prognostic factors were essentially hepatic encephalopathy, spontaneous ascites fluid infection, hyponatremia and stage C of Child-Pugh score.

Keywords

Cirrhosis, Portal Hypertension, Child-Pugh, Encephalopathy, Prognostic, Côte d'Ivoire

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How to cite this paper: Yao Bathaix, M.F., *et al*. (2015) Prognostic Factors for Cirrhosis Hospital in Abidjan (Côte d'Ivoire). *Open Journal of Gastroenterology*, **5**, 103-109. http://dx.doi.org/10.4236/ojgas.2015.57017

1. Introduction

Cirrhosis is the final stage of development of liver fibrosis induced more by chronic liver disease. It is defined by the existence of an architectural modification diffuse hepatic parenchyma characterized by the existence of extensive fibrosis, dissecting and delimiting annular hepatocyte nodules so-called regeneration [1]. The complications of cirrhosis are frequent and potentially serious: portal hypertension, the cause of bleeding from ruptured gastroesophageal varices, hepatic encephalopathy, infection of ascites fluid, hepatorenal syndrome and hepatocellular carcinoma [2].

Cirrhosis is an important hepatobiliary disorder under our tropics [3] and is the leading cause of hospitalization for chronic liver disease in gastro enterology hospital in Côte d'Ivoire [4].

The management of portal hypertension with cirrhotic patients is a major concern for hospital practitioners. It is the cause of a high rate of mortality [5] [6]. In fact, many factors predispose cirrhosis patient to the risk of unexpected arrival of a multi deep-rooted default likely to imperil the vital prognostic: immune dysregulation that will promote the risk of infection, pulmonary involvement by the hepatopulmonary syndrome, a decrease of coagulation factors and renal hypoperfusion caused by the hepatorenal syndrome [7]. The evaluation of the prognosis of cirrhotic patients followed in hospitalization would improve their care. We conducted this study in cirrhotic patients in order to estimate the death incidence and to identify risk factors to which cirrhotic patients in Ivorian hospitals are exposed.

2. Methodology

2.1. Study Oversight

From January 2002 through December 2011, we consecutively enrolled patients with cirrhosis and portal hypertension who were admitted to Centre Hospitalier et Universitaire de Yopougon in Abidjan. No commercial support was involved in the study. All the authors vouch for the integrity and the accuracy of the analysis and for the fidelity of the study. No one who is not an author contributed to the manuscript.

2.2. Selection of Patients

Patients who had cirrhosis and portal hypertension were considered for the inclusion. The diagnosis of cirrhosis was based on the combination of clinical, biological, echographical and/or endoscopical criteria. Exclusion criteria were a lost sight below12-months-follow-up and hepatocellular carcinoma (HCC) at the inclusion, whose diagnosis was based on the Barcelona criteria.

2.3. Studied Variables

The sociodemo graphic variables were the age, the gender and the socioeconomic status. The clinic variables studied were ascites, limbs edema, gastrointestinal bleeding, hepatic encephalopathy. The endoscopic variables were the esophageal varices, the gastric varices and the portal hypertensive gastropathy. The biological variables were the prothrombin rate, the bilirubin, the albuminemia, the natremia, the creatinine and the platelets. The etiology of cirrhosis has also been studied.

These data were collected from the files of hospitalized patients on pre-established survey forms.

2.4. Statistical Analysis

The results are expressed as frequency, percentage, or mean ± standard deviation and median. The survival is estimated by the Kaplan-Meier Curve and the comparison of survival curbs by the Log-rank test. The multivariable analysis was conducted with Cox proportional Hazard regression. A p value < 0.05 was taken as significant.

3. Results

Over the period of our study we recruited 221 patients (135 men) with an average of 59 ± 15.12 years. The middle socio-economic status was the most represented with 56.15% of the patients. The main etiology of cirrhosis was HVB (76.04%) followed by alcohol. The edema and ascites syndrome was present in almost all patients. Also 19.45% of patients had gastrointestinal bleeding and hepatic encephalopathy (47.05%). On average, patients had a high rate of creatinine (16.18 mg/L ± 19.58) and a decreasing of platelet (131.27×10^9 L^{-1} ± 96.82).

Patients were classified as Child-Pugh B and C in the respective proportions of 52.92% and 32.76%. The epidemiological, clinical, biological and endoscopic characteristics of the patients during their hospitalization are shown in **Table 1**.

The overall survival of patients was between 0.03 and 16.66 person-months, with a median of 0.50 person-months (**Figure 1**).In univariate analysis, hepatic encephalopathy, Child-Pugh C, renal failure, spontaneous ascites fluid infection (SAI) and hyponatremia were associated with a significant survival decrease. However, the diuretic outlet would significantly improve the survival (**Table 2**).

Stage C of the Child-Pugh score was associated with a significant increase (p = 0.046) of 3.351 times of death

Table 1. Demographics, clinical, biological and endoscopic characteristics of patients.

Number of patients	221
Socio-demography	
-Age	14 years - 86 years (59 ± 15.12 years)
-Sex ratio (M/F)	2.06
-Socioeconomic status	high (8), middle (117), low (80), unspecified (16)
Etiology	HBV* (76.04%), alcohol (11.06%) not identified (9%), HCV** (3%)
Clinic	
-Ascites ± edema in the lowerextremities	ascite (136), ascite + ankle edema (91)
-gastrointestinal bleeding	43
- hepatic encephalopathy	104
Portal hypertension endoscopicsigns (113 patients)	OVs*** stage I (20), OVs Stage II (58), OVs stage III (35), bleeding gastric varices (04) Gastropathy http (71)
Biologicalparameters	
-Prothrombinrate (N ≥ 70%)	16% - 100% (mean 57.27 ± 23.21; median 55)
- Bilirubin (N < 10 mg/l)	0.28 - 6.2 mg/l (mean30.66 ± 23.64; median 22.5)
-Albumin (N = 35 - 50 g/l)	6.1 - 63.7 g/l (mean 25.35 ± 9.98; median 25)
-Natremia (N = 135 - 145 meq/l)	96 - 172 meq/l (mean 135.08 ± 9.52; median 135)
-Creatinine (N < 15)	3 - 176 mg/l (mean 16.18 ± 19.58; median 10.25)
-platelets (N = 150 - 450 GIGA/L)	14 - 670 GIGA/L (mean 131.27 ± 96.82; median 108)
Child Pugh score	
Stage A/Stage B/Stage C	28/117/76

HBV*: hepatitis B; HCV**: Hepatitis C; OVs***: Bleeding esophageal varices.

Table 2. Prognostic factors in univariate analysis.

Variables	n	p
Male	149	0.3029
Ascite decompensation	163	0.4457
hepatic encephalopathy	104	0.0029*
Infection of ascites	50	0.0208*
Child Pugh C	76	0.0460*
gastrointestinal bleeding	43	0.0992
Thrombocytopenia	124	0.5693
Renal failure	38	0.0858
Diuretics	60	0.0458*
Administration of beta blockers	84	0.3010
Hyponatremia	35	0.0434*

*p < 0.05.

Hazard Ratio [CI: 1.023 to 10.977] as compared with stage A (**Figure 2**). In multivariate analysis, hepatic encephalopathy and gastrointestinal bleeding were associated with the survival decrease and the use of diuretic would improve the prognostic (**Table 3**).

4. Discussion

This study confirms the high frequency of viral B cirrhosis in our country in the light of our literary review [4].

Table 3. Prognostic factors of survival in multi varied analysis.

Variables	Hazard Ratio	p	Interval of confidence
Child-Pugh score C	1.281	0.497	0.627 - 2.618
Added bacterial infection	1.794	0.169	0.779 - 4.131
Diuretics	0.387	0.002*	0.209 - 0.714
Hyponatremia	1.093	0.788	0.571 - 2.094
Gastrointestinal bleeding	0.402	0.030*	0.177 - 0.917
Encephalopathy	2.223	0.035*	1.056 - 4.699

*$p < 0.05$.

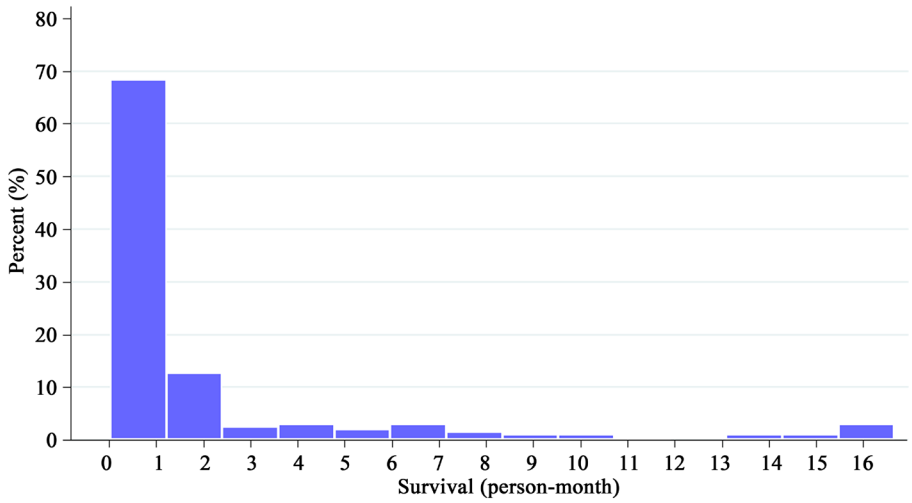

Figure 1. Distribution of patients according to survival time.

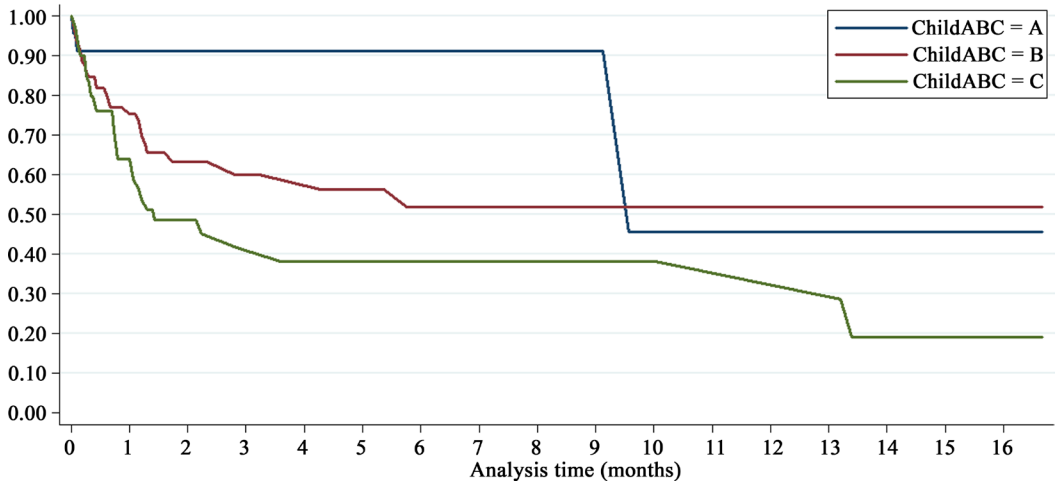

Figure 2. Survival in patients with cirhhosis according to the child-pugh score.

Besides, we have also established a weak proportion of alcoholic cirrhosis which is quite probably under estimated because of the consumption of alcohol that was not confessed. On the contrary, the etiology of the cirrhosis has not been established within 10% of the cases. This considerable proportion is due to many factors: insufficiency of investigations because of lack of means, undeclared consumption of alcohol.

The duration of the overall survival of the patients has run from 0.03 to 16.66 per month with a median of 0.50 patient-month. This means that we have registered 0.5 deaths out of 221 patients-months. Also, this is a proof that the patients were at an advanced stage of cirrhosis before their hospitalization with a reserved prognostic. In fact, in our study 34.39% of the cirrhosis patients were classified at stage C where as 52.94% of them were classified in stage B. It is not easy to establish the direct causes of cirrhosis patient's death [7]. In univariate analysis, 5 parameters (encephalopathy, spontaneous ascetic fluid infection, hyponatremia, renal failure and the score Child-Pugh C) were significantly associated with bad prognosis and the taking of diuretic was significantly associated with improved survival.

The occurrence of hepatic encephalopathy significantly has decreased the survival of our patients ($p = 0.0029$). This is consistent with several studies that have shown that hepatic encephalopathy was responsible for a high rate of death with cirrhotic patients [8].

In our study, ascites was the most common complication of cirrhosis [9] and is associated with a bad prognosis with a considerable reduction of survival-rate of patients [10] [11].

Moreover, with regard to our test sample, the spontaneous ascites fluid infection with our patients significantly reduced their chances of survival ($p = 0.0208$). This massive mortality can be likely associated with the development of a systematic inflammatory reaction [12]. The spontaneous ascites fluid infection is a frequent factor of complication with cirrhotic patients [13].

The survival of patients who have recovered from a prior episode of spontaneous ascites fluid infection is 30% over a period of 1 year with a prognostic that depends on the gravity of cirrhosis [14].

The risk factors of the spontaneous ascites fluid infection are manifold: antecedents of ascites fluid infection in the absence of antibiotic prophylaxis [15], gastrointestinal bleeding [16], albuminemiea < 28 gr/l, alcoholic etiology and Child-Pugh C [17]. In Ivory Coast, the ascites fluid infection is the first cause of death with cirrhotic patients [18]. The prognosis has improved considerably in recent years with the early use of antibiotic, a support of renal failure when it exists and a primary or secondary antibiotic prophylaxis [14].

The use of diuretic has improved significantly the survival of patients ($p = 0.0458$). Research studies should be urged on in order to better assess the added value of diuretics in the survival of cirrhosis patients with edema and ascites syndrome. However, their side effects and unfitness with cirrhosis patients minimize their use [19].

The presence of an hyponatremiea was forcibly associated with a decrease of a survival among the study sample ($p = 0.0434$). Many studies [20] [21] have revealed that a natremia ≤ 130 m·mol/l was a negative prognostic factor to which an elevated rate of death is associated with cirrhotic patients.

Renal failure has decreased survival without statistical significance with our patients ($p = 0.0858$) in contrast to the literature [21] where they are significantly associated. This lack of significance of our results can be explained by the fact that the inclusion criteria of hepato-renal syndrome were not clearly established during our inquiry, which means that it was under estimated and that the retrospective character of our study did not allow us to reach that stage. Renal function is frequently impaired in cirrhosis [7] [21] [22]. Hospital mortality due to renal failure despite adequate support is around 30% [23].

Stage C of Child-Pugh score was associated with an important increase ($p = 0.046$) by 3.351 time of death hazard-ratio in our sample.

Stage C of the Child-Pugh score is an independent factor that predisposes the patient to death [24] [25].

By a multivariate analysis, the survival of a hepatic encephalopathy in the course of cirrhosis was an independent parameter that has significantly reduced the patients chances of survival. In fact, the hepatic encephalopathy was associated with a significant increase in mortality ($p = 0.035$). Despite a better understanding of hepatic encephalopathy, of its symptomatic factors and its care taking, its mortality both in hospitalization as well as in the reanimation units remains high [26]. The development of hepatic encephalopathy with cirrhosis patients is associated with high lethality: 41% to 80% at one (1) year and 77% to 85% at three (3) years [26] [27].

The use of diuretics was associated with a significant decrease ($p = 0.002$) of 0.386 time (more than half) of the death Hazard Ratio. The gastrointestinal bleeding was associated with a significant decrease of mortality ($p = 0.030$). Indeed, the death cases that are caused by the first episodes of gastrointestinal bleeding of portal hypertension on cirrhosis is high but is also dependent on the area where bleeding occurs [28]. Our results could

be explained by a proper application of resuscitation measures especially with patients having crossed the transfusion threshold although the specific charge made is not optimal [29] and the high rate of primary and secondary prophylaxis with beta blockers [22] [25].

The score of Child-Pugh is not independently associated to morality (p = 0.497) as the literary review seems to indicate [7]. Indeed, it does not take into account some factors that may have a significant impact on prognosis as renal function. This has led to the creation of other scores such as the MELD score (model for end-stage liver disease) [30] which is used in the assessment of medium prognostic of cirrhotic patients and the indication of hepatic transplantation. However, the prognostic value of the Child-Pugh score at one (1) or two (2) years is clearly known [6] [24].

The limitations to our study are the relatively small number of patients, due to the retrospective nature of the study with several missing data. Indeed, some hospitalized patients have not been able to do their para clinical examinations. Therefore, the survival time associated with the various parameter studied could be less than the duration of survival in subjects with cirrhosis and portal hypertension in the general population. Insufficient etiological research because of the cost of viral markers and the lack of quantitative and qualitative assessment of the consumption of alcohol is prior to the study.

5. Conclusion

Cirrhotic patients with portal hypertension mortality are high in Abidjan. Pejorative prognostic factors are hyponatremia, ascites fluid infection and hepatic encephalopathy. The use of diuretics and beta blockers were indicated when associated with improved survival.

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