

Complications of Viral and Non Viral Cirrhosis Requiring the First Hospital Admission and In-Hospital Death Related to These Complications in Morocco during the Last 2 Years

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Abstract

Background/Aims: Data on the epidemiology of viral and non viral cirrhosis, especially in African countries, are limited. We compared the epidemiology and clinical characteristics requiring the first hospital admission and causing in-hospital mortality between viral and non viral cirrhosis over the last two years. The identification of patients at higher risk for adverse outcomes can aid in making the clinical decisions that will improve the prognosis for these patients.

Methods: We retrospectively examined the datasets of 400 inpatients of Ibn Rochd university hospital in Morocco from November 2019 until March 2022. The study included patients who were admitted due to specific complications of liver cirrhosis. We compared the causes of first hospital admission and in-hospital deaths between patients with viral (hepatitis B virus & hepatitis C virus) and non viral related liver cirrhosis.

Results: Among the included 400 hospitalisations (400 patients), ascites was the most common complication requiring the first hospital admission among the two groups followed by variceal bleeding and hepatic encephalopathy (HE). Deaths were mostly attributable to variceal bleeding and hepatic encephalopathy (HE) associated with high child-pugh scores.

Conclusion: The major causes of first admission in viral and non-viral cirrhosis are ascites and variceal bleeding. Variceal bleeding showed the highest percentage among causes of in-hospital mortality in both groups. Adjusted prevention-centered public health measures and early and opportune diagnosis of this disease are needed to prevent the development of complications and to improve outcome in cirrhotic patients.

Abbreviations

HBV: hepatitis B virus

HCV: hepatitis C virus

SBP: Spontaneous Bacterial Peritonitis

HE: Hepatic encephalopathy

HCC: Hepatocellular carcinoma

HRS: hepatorenal syndrome

HCV RNA: Hepatitis C virus ribonucleic acid

NASH: Non alcoholic steato-hepatitis

NAFLD: Non alcoholic fatty liver disease

AALD: Alcoholic associated liver disease

Introduction

Liver disease, including cirrhosis, is an important cause of mortality in middle east and north Africa and worldwide. It was the eighth leading cause of death in 2015 [1]. Various chronic liver diseases end by liver cirrhosis [2,3]. The common complications of liver cirrhosis are ascites, jaundice, variceal bleeding, spontaneous bacterial peritonitis (SBP), hepatic encephalopathy (HE), hepatocellular carcinoma (HCC) or hepatorenal syndrome(HRS) [4]. This phase of the disease has been designated “decompensated cirrhosis” [5]. In Morocco, viral hepatitis is widely spread making it the leading cause of cirrhosis [6,7].

Despite the global growing economic and public burden of cirrhosis, data on the epidemiology of viral and non viral cirrhosis are extremely limited in Morocco.

The aim of this epidemiological study was to compare the baseline characteristics, recent trends in the first cause of hospital admissions and in-hospital mortality attributable to that cause between patients with viral and non viral related liver cirrhosis in a Moroccan cohort of 400 patients admitted to the hepatology and gastroenterology department of Ibn Rochd university hospital in Casablanca. Accordingly, clinical decisions can be made to improve the prognosis for Moroccan patients who are at higher risk for adverse outcomes.

Materials and Methods

Patients

A retrospective analysis was conducted using the medical record databases of Ibn rochd university hospital in Casablanca, Morocco. Patients who had been hospitalized for the first cirrhosis-related complications including ascites, variceal bleeding, SBP, HE, HRS, portal thrombosis, HCC or acute on chronic liver failure were included. We determined the causes of admission and in-hospital death by reviewing the discharge records. Medical records of 400 hospital admissions (400 patients) were reviewed. The study population comprised 400 patients with decompensated HBV and HCV-related liver cirrhosis or non viral related liver cirrhosis who had been hospitalized for the first time in Ibn Rochd hospital from November 2019 to March 2022. HBV-related liver cirrhosis was recorded on the chart in case of hepatitis B surface antigen had been present. HCV-related liver cirrhosis was documented on the chart in the presence of antibody to HCV and HCV RNA in the serum. Patients with excessive alcohol consumption together with HBV or HCV infection were classified as having liver cirrhosis with a combined cause. NAFLD (Non alcoholic fatty liver disease) related cirrhosis was considered in patients who were obese and /or diabetic with the presence of steatosis and absence of other causes. However, biopsy was not taken to confirm NASH (non alcoholic steato-hepatitis) or AALD (alcoholic associated liver disease).

Statistical Analyses

Data are expressed as means±standard deviation for continuous variables or as counts (percentages) for categorical variables. The t-test was used to compare continuous variables, and the chi-square test was used to compare categorical variables. A p-value of <0.05 was considered to indicate statistical significance.

Results

Baseline Characteristics

From November 2019 to March 2022, 400 patients were admitted (159 with viral related liver cirrhosis and 241 with non viral related liver cirrhosis). The mean age of patients with viral related cirrhosis patients and non viral related cirrhosis was 61 ± 9.4 and 56.2 ± 15 , respectively; $p<0.0001$. More male patients had viral related liver cirrhosis while more females had non-viral related liver cirrhosis (table 1). HBV and HCV related liver cirrhosis was the leading the cause of liver cirrhosis (159 patients 39.8%), among patients who had been hospitalized due to cirrhosis complications, followed by non-alcoholic fatty liver disease (NAFLD) (52 patients 13%), autoimmune hepatitis related cirrhosis (45 patients 11.3%) and alcoholic cirrhosis (30 patients 7.5%) (figure1).

Table 1

Characteristic	Total (n=400)	Viral n=159	Nonviral n=241	P value
Age	58.1±13.3	61.±9.4	56.2±15	<0.0001
Male sex	207(42.5%)	88(55.3%)	119(49.3%)	0.242
Female sex	193(48.2%)	71(44.6%)	122(50.6%)	0.242

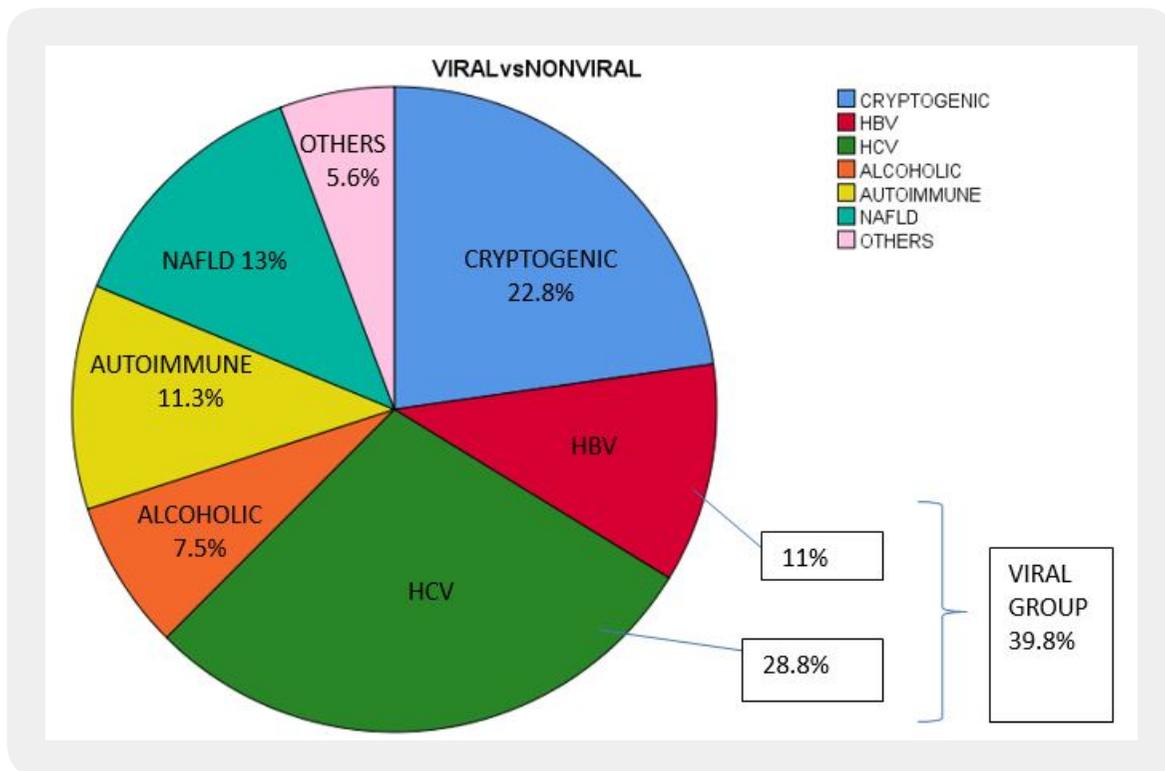


Figure 1: Comparison of the etiology of liver cirrhosis. In hospitalized patients, HBV and HCV were the most common causes of liver cirrhosis, followed by NAFLD

HCV, hepatitis C virus; HBV, hepatitis B virus.

Trends in Causes of Hospitalization

The most frequent causes of the first hospital admission in both groups were ascites (203 patients 50.7%) and variceal bleeding (138 patients 34.5%) followed by HE (26 patients 6.5%). The proportion of infections (ex. urinary infections) as a cause of first hospital admission was low at 2.3% (9 patients). The less frequent causes were portal thrombosis, jaundice, SBP and acute hepatitis (table 2). The proportion of ascites, as a first complication, in viral related cirrhosis was significantly higher than that in non viral cirrhosis (72.6% vs 42.3%, p <0.0001). The study revealed that HCC was found in 14 patients who were admitted for other causes such as ascites (11 patients 78.6%, p =0.034), variceal bleeding (1 patient 7% p=0.05) and HE (2

patients 14% p=0.229). Regarding child pugh score at first hospital admission, 122 patients (30.5%) were score A, 181 patients (45.3%) were score B and 97 patients (24%) were score C.

Trends in Causes of In-Hospital Death

The in-hospital mortality rate at first hospital admission was 5.7% (23 patients). Variceal bleeding (12 patients 52%) and HE (7 patients 30%) were the most frequent causes of in-hospital deaths (table 3). While the proportion of variceal bleeding in viral group (4 patients 66.7%) was higher than that in non viral group, HE showed a higher proportion in non viral group (6 patients 35.3%). 19 patients (82%), who died at first hospital admission, had advanced child pugh score (score B and C).

Table 2

Causes of hospital admission	Total n=400	Viral n=139	Non-viral n=127	P value
Ascites	203 (50.7%)	101 (72.6)	102 (42.3)	<0.0001
Variceal bleeding	138 (34.5)	42 (30)	96 (39.8)	0.006
HE	26 (6.5)	8 (5.7)	18 (7.4)	0.333
Infections	9 (2.2)	2 (1.4)	7 (2.9)	0.458
Portal thrombosis	7 (1.7)	4(2.8)	3 (1.2)	0.443
Jaundice	7(1.7)	1(0.7)	6(2.4)	0.318
SBP	5(1.2)	1(0.7)	4(1.6)	0.652
Acute hepatitis	5(1.2)	0	5(2)	0.162

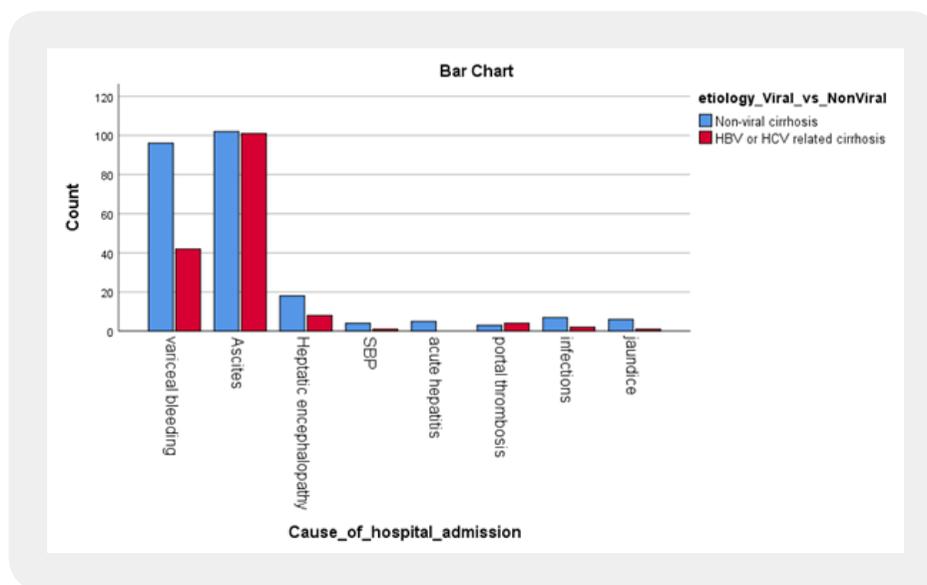


Figure 2

Table 3

Death causes	Total =23	Viral n=6	Non viral=17	P value
Variceal bleeding	12 (52%)	4 (66.7%)	8 (47.1%)	0.640
HE	7(30%)	1 (16.7%)	6(35.3%)	0.621
Infections	2(8%)	0	2 (11.8%)	1.00
Jaundice	1(4%)	0	1(5.9%)	1.00
Portal thrombosis	1(4%)	1(16.7%)	0	0.261

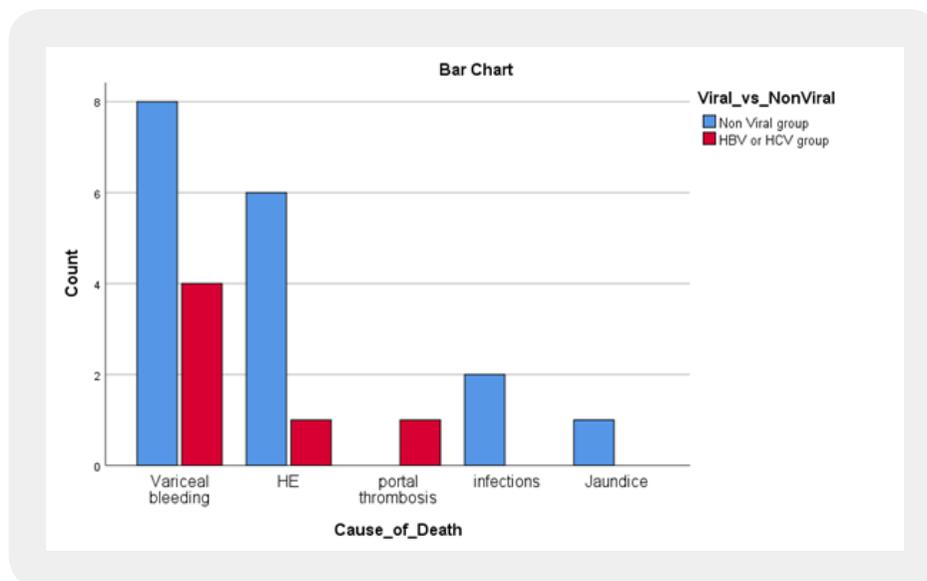


Figure 3

Discussion

Cirrhosis is one of the major causes of mortality, accounting for about 77,000 deaths per year in Middle East and North Africa [1]. Despite the substantial burden of HCV and HBV related liver cirrhosis on public health and the economy, few studies have investigated the epidemiology of viral and non viral related liver cirrhosis in Morocco. This study retrospectively analyzes the epidemiology at the first hospital admission in cirrhotic patients and the causes of in-hospital mortality among viral and non-viral related liver cirrhosis in the university hospital of Casablanca, Morocco. In this study, we found that the proportions of ascites and variceal bleeding accounting for hospitalization were the highest in both groups. We also found that that the major cause of in-hospital death was variceal bleeding in viral related liver cirrhosis, while in non-viral related liver cirrhosis, variceal bleeding and HE showed the highest proportion.

In Morocco, the most common cause of liver cirrhosis is reportedly HCV followed by HBV [6] [7]. However, the prevalence of HCV and HBV-related liver cirrhosis is expected to decrease with the introduction of vaccination, potent antiviral agents and by launching the national campaign to eliminate HCV. The proportion of NAFL related cirrhosis is considerably high in Morocco because it is considered the first cause of cirrhosis in non-viral causes and the second cause of all causes according this study. This is probably due to the 6-fold global increase of the prevalence of obesity over the last 4 decades [8]. Additionally, there is an increase in diabetes in the world among adults [9]. Although there is limited data on the epidemiology of alcoholic liver cirrhosis, it seems that alcoholic associated liver disease is not a prominent cause of cirrhosis.

HCC was not a cause of first hospital admission in cirrhotic patients in this study but it was found in some patients admitted for other causes. The majority of cases who had HCC were admitted for ascites.

In-hospital mortality in cirrhotic patients with acute decompensation is high and it is higher than that of patients with other diseases [10]. The fact that there are numerous factors that determine hospital mortality must be taken into account and they include disease stage, complications, infections, organ dysfunction, acute-on-chronic liver failure, and clinical status upon admission [11-13]. In our patient cohort, in-hospital mortality at first admission was 5.7% and the most frequent causes of death were variceal bleeding and HE. The majority had high child-pugh scores. These percentages are considered high and this may be due to shortage of some important medications such as somatostatin which is fundamental in variceal bleeding. Another cause is that transferring cirrhotic patients to ICU takes time due to shortage of beds especially during the epidemic of the COVID-19 and due to the bad prognosis of cirrhotics with high child-pugh scores giving them less priority. These data suggest the need for new public health measures for the prevention and early and opportune diagnosis of this disease, such as increasing the awareness of screening and treatment of hepatitis C virus, so that the development of complications that darken the outcome in patients with cirrhosis can be prevented and delayed.

This study has some limitations. First, we did not perform a liver biopsy to confirm the alcoholic cirrhosis and NASH related cirrhosis. Due to the absence of definitive diagnostic criteria for the pathologic diagnosis of alcoholic cirrhosis and NASH, we used clinical diagnosis of alcoholic cirrhosis and NAFLD in addition to radiological findings in NAFLD. Secondly, the enrolled patients did not present the entire population of hospitalized patients with cirrhosis in Morocco.

Nevertheless, the strengths of this study were that a relatively large number of patients were enrolled in the analysis. Additionally, we investigated the trend of complications and in-hospital deaths among cirrhotic patients who were hospitalized in a university hospital stratified according to viral and non-viral cirrhosis.

Conclusion

In conclusion, the proportions of ascites and variceal bleeding were the highest among causes of first admission in both viral and non-viral related cirrhotic patients. Variceal bleeding was the major cause of in-hospital death in both groups and HE was the second major cause in non-viral group. The adaptation of public health measures directed towards prevention and early and opportune diagnosis of this disease is necessary to prevent the development of complications and improve outcome in cirrhotic patients.

Conflicts of Interests

No conflicts of interest are to be declared.

Bibliography

1. Asrani, S. K., Devarbhavi, H., Eaton, J. & Kamath, P. S. (2019). Burden of Liver Diseases in the World. *Journal of Hepatology*, 70(1), 151-171.
2. Chatterjee, R. & Mitra, A. (2015). An overview of effective therapies and recent advances in biomarkers for chronic liver diseases and associated liver cancer. *Int Immunopharmacol.*, 24(2), 335-345.
3. Mitra, A., Satelli, A., Yan, J., et al. (2014). IL-30 (IL27p28) attenuates liver fibrosis through inducing NKG2D-rae1 interaction between NKT and activated hepatic stellate cells in mice. *Hepatology*, 60(6), 2027-2039.
4. Angeli, P., Bernardi, M., Villanueva, C., Francoz, C., Mookerjee, R. P., Trebicka, J., Krag, A., Laleman, W. & Gines, P. (2018). EASL Clinical Practice Guidelines for the management of patients with decompensated cirrhosis. *Journal of Hepatology*, 69(2), 406-460.
5. D'Amico, G. (2014). The clinical course of cirrhosis. Population based studies and the need of personalized medicine. *J Hepatol.*, 60(2), 241-242.
6. Atitar, I., Kabbaj, N., Amrani, L., Salihoun, M., Acharki, M., Guedira, M., Nya, M., Amrani, N.. Les cirrhosis: profil etiologique et evolutif a travers l'experience d'un service marocain. *JFHOD*, 110(6), 85-91.
7. RHEZALI, M. (2007). Profile etiologique de la cirrhose CHU de Marrakech THESE N° 57.
8. NCD Risk Factor Collaboration (NCD-RisC)(2017). Worldwide trends in body-mass index, underweight, overweight, and obesity from 1975 to 2016: a pooled analysis of 2416 population-based measurement studies in 128.9 million children, adolescents, and adults. *Lancet*, 390(10113),2627-2642.
9. Browning, J. D., Szczepaniak, L.S., Dobbins, R., Nuremberg, P., Horton, J. D., Cohen, J. C., et al. (2004). Prevalence of hepatic steatosis in an urban population in the United States: impact of ethnicity. *J Hepatology*, 40(6), 1387-1395.
10. Bunchorntavakul, C., Chamroonkul, N. & Chavalitdhamrong, D.(2016). Bacterial infections in cirrhosis: A critical review and practical guidance. *World J Hepatol.*, 8(6),307-321.
11. D'Amico, G., Garcia-Tsao, G. Pagliaro, L. (2006). Natural history and prognostic indicators of survival in cirrhosis: A systematic review of 118 studies. *J Hepatol.*, 44(1), 217-231.

12. Cholongitas, E., Senzolo, M., Patch, D., *et al.* (2006). Review article: Scoring systems for assessing prognosis in critically ill adult cirrhotics. *Aliment Pharmacol Ther.*, 24(3),453-464.
13. Lim, L.G., Tan, X.X., Woo, S.J., *et al.* (2011). Risk factors for mortality in cirrhotic patients with sepsis. *Hepatol Int.*, 5(3), 800-807.