

Cirrhosis at the Ouahigouya Regional Teaching Hospital: Status Report and Diagnostic and Therapeutic Challenges in a Region with Limited Resources

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Abstract

Cirrhosis is a relatively common hepatobiliary pathology in developing countries. It is associated with multiple complications, and its management is often delayed. **Objective:** The aim of this study was to evaluate the epidemiological, clinical, paraclinical and prognostic aspects of cirrhosis in the hepato-gastroenterology department of the teaching hospital of Ouahigouya. **Methodology:** this was a cross-sectional observational-analytical study with retrospective data collection, carried out on the inpatient ward at the Ouahigouya's regional teaching hospital from January 1st, 2021, to December 31st, 2023. Results: 96 cases were collected. The mean age of the patients was 45.72 years old, with a male predominance of 77%. No patient had been vaccinated against hepatitis B virus (HBV). Etiologies of cirrhosis were dominated by HBV (75%), alcohol (7.29%) and hepatitis C virus (HCV) (4.17%). The average admission time was 36 days. The main functional signs on admission were abdominal distension (56.21%) and abdominal pain (51.04%). Ascites (80.21%), pelvic limb edema (66.67%), jaundice (64.58%) and hepatomegaly (45.83%) were the most frequently encountered physical signs. The most frequent biological abnormalities were cholestasis syndrome (82.43%) and hypoalbuminemia (89.83%). Upper GI endoscopy revealed esophageal varices in 88.37% of cases. The clinical course was marked by complications in 51.04% of patients, including hepato-

cellular carcinoma (73.4%), hepatic encephalopathy (22.4%), hepatorenal syndrome (12.2%), upper GI haemorrhage and ascites fluid infection (10.2%) in each case. In-hospital mortality rate was 43.75%, with hepatocellular carcinoma the main cause. **Conclusion:** Cirrhosis was discovered late in the decompensation or complication stages in our hospital. HBV is the predominant etiology. The benefits of hepatitis B vaccination have yet to be felt.

Keywords

Cirrhosis, Hepatitis B Virus Hepatitis C Virus, Hepatocellular Carcinoma, Ouahigouya Teaching Hospital, Burkina Faso

1. Introduction

Cirrhosis is a major public health problem worldwide, accounting for 2.4% of deaths [1]. In fact, it is the 9th leading cause of death in South-East Asia and Europe, and the 10th in Africa. Along with viral hepatitis and hepatocellular carcinoma (HCC), it accounts for 4% of deaths worldwide [2]. It is a diffuse liver disease characterized by two main lesions: mutilating annular fibrosis and regenerative nodules [3]. This anatomopathological disorganization is often the starting point for HCC, making cirrhosis a precancerous lesion.

Among the causes of cirrhosis, chronic alcoholism is the most common in developed countries, and particularly in France. [2] while chronic viral hepatitis ranks first in Africa. Indeed, the prevalence of hepatitis B virus (HBV) infection remains high, at 8%, with 750 million people infected and 65 millions living with a chronic form of the disease in Africa [4].

The prevalence of HBsAg carriers is estimated at between 9% and 15% [5].

In our countries, it is diagnosed at the stage of complications [4] [6] in relation to its pauci-symptomatic or asymptomatic features and its lack of awareness among our populations.

In Burkina Faso, few studies have been carried out on cirrhosis. In a 2001 study by Tinto *et al.* at the Yalgado Ouedraogo Teaching Hospital in Ouagadougou, cirrhosis accounted for 5.9% of all hospital admissions and 27.2% of chronic liver disease [7]. Ten years later, in 2012, Sawadaogo *et al.* at the Sourou Sanou teaching hospital in Bobo-Dioulasso, reported that cirrhosis accounted for 6.5% of all hospitalizations and 46.8% of chronic liver diseases [8]. In recent years, the Hepato-Gastro-Enterology Department of the Ouahigouya teaching hospital has empirically observed a large number of cirrhosis-related hospitalizations, and we have no studies on this condition. In fact, in 2022, 51 patients were consulted for cirrhosis, 43 of whom were hospitalized, according to monthly activity reports.

The aim of this study was to assess the extent of cirrhosis through its epidemiological, clinical, paraclinical and therapeutic aspects at CHUR-OHG in order to

improve its management.

2. Patients and Method

Our study took place in the General Medicine office, more specifically in the Hepato-Gastro-Enterology department of Ouahigouya teaching hospital. This was a descriptive cross-sectional study with retrospective data collection, conducted during the period from January 1st, 2021, to December 31st, 2023.

All patients diagnosed with cirrhosis during the study period and meeting the inclusion criteria were selected. Inpatients with a diagnosis of cirrhosis based on clinical, biological and morphological evidence were included. Incomplete files were excluded.

Cirrhosis was defined by a combination of clinical and paraclinical criteria.

Clinical criteria: presence of functional signs such as asthenia, jaundice or asymptomatic patient in compensated cirrhosis.

and/or

Biological abnormalities:

- Cytolysis
- Cholestasis
- Hepatocellular failure due to low prothrombin levels

And/or

Imaging abnormality (ultrasound or CT scan):

- Dymorphia: abnormal contours
- Heterogeneous parenchyma
- Presence of nodules

Biological parameter standards used in our study:

- ALAT < 40 IU
- ASAT < 40 IU
- Total bilirubin: 5 - 17 micromol
- Conjugated bilirubin: < 4 µmol/l
- Gamma GT: < 28 UI/l
- PAL: 20 - 80 IU/L
- Prothrombin rate: 70% - 100%.

The sub-chapter on operational definitions clearly specify the diagnostic criteria and the different clinical presentations of cirrhosis.

Data was collected on a pre-established survey form. All medical records were reviewed by a internship physician under the supervision of a senior member of staff, in order to retain only those records that could be used. For each patient:

- ❖ Check for risk history and functional signs: abdominal pain, signs of upper or lower digestive haemorrhage and personal history of jaundice, blood transfusion, alcohol intake and a notion of liver disease or other known illnesses,
- ❖ Clinical examination to look for a large liver and its characteristics, splenomegaly, jaundice, ascites, IMO, CVC, fever, hepatic encephalopathy, pathology of other organs through a general systemic examination.

❖ **Paraclinical examinations**

- Blood count for anemia, thrombocytopenia, leukopenia or pancytopenia.
- Check for hepatic cytolysis by measuring aminotransferase activity.
- Check for hepatocellular insufficiency by measuring prothrombin and bilirubin levels.
- Creatinine levels to check for impaired renal function (elevated creatinine levels).
- Examination of ascites fluid for bacterial infection.
- Etiological testing for HBs antigen and anti-HCV antibodies.
- Abdominal ultrasound to assess liver morphology and look for signs of portal hypertension and peritoneal effusion.
- Upper GI endoscopy for signs of portal hypertension and VO.

The data collected was entered and analyzed on a computer using EPI info software version 7.2.5.0.

Ethical considerations

Data was collected with respect for patient anonymity and confidentiality. The agreement of the hospital senior management was obtained prior to the start of the study.

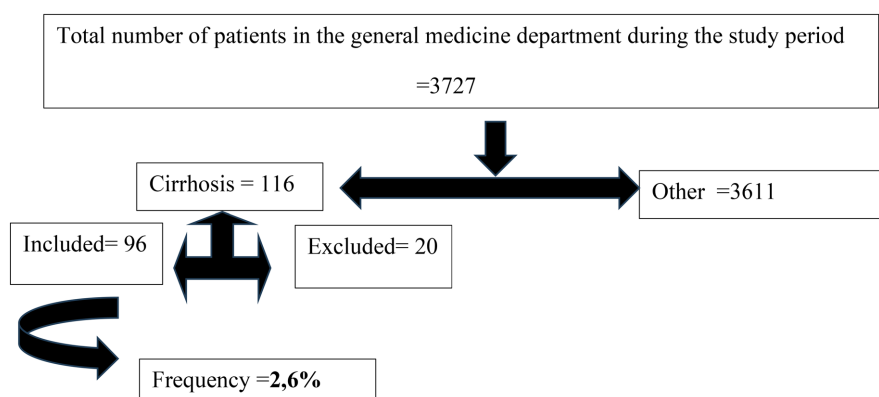
Operational definitions

- ❖ The diagnosis of cirrhosis has been established on the basis of a range of clinical and paraclinical arguments.
- According to the two stages of cirrhosis:
 - ✓ compensated cirrhosis for asymptomatic patients who have been hospitalized following paraclinical examinations.
 - ✓ decompensated cirrhosis for patients who have presented a decompensation (ascitic, edematous or edemato-ascitic) and/or a complication related to cirrhosis (hepatocellular carcinoma, digestive hemorrhage, etc.).
 - By the presence of painless, firm, irregular-surfaced hepatomegaly with a sharp lower border, associated with signs of Hepatocellular Insufficiency (cutaneous-epidermal syndrome, signs of hemorrhage and hepatic encephalopathy); portal hypertension (collateral venous circulation, ascites, splenomegaly) or cholestasis (discolored stools, dark urine, jaundice, pruritus).
 - Paraclinics
 - ✓ Abdominal ultrasound showing atrophic or hypertrophic liver with cirrhotic appearance.
 - ✓ A biological examination showing abnormalities of liver damage: cytolysis or hepatocellular insufficiency.
- ❖ The complications of interest were:
- Hepatocellular carcinoma on the basis of elevated alpha-feto-proteins, whether or not associated with one or more hepatic nodules on liver ultrasound; with a wash-in and wash-out appearance on CT scan.
 - Upper GI hemorrhage due to rupture of esophageal varices, externalizing as melena or hematemesis.

- Infection of ascites fluid by performing an ascites fluid culture, or in the presence of a patient presenting ascites with fever, abdominal pain or hepatic encephalopathy.
- Hepatic encephalopathy in the presence of altered consciousness with increased hepatocellular insufficiency in cirrhotic patients.
- Hepatorenal syndrome caused by impaired renal function, apart from the administration of diuretics and any other cause of renal impairment.

3. Results

• Hospital frequency



• Socio-demographic data

During this period, 3727 patients were hospitalized in the medical department; 116 cases of cirrhosis were identified, and 96 patients were selected. Cirrhosis accounted for 2.6% of the pathologies encountered.

The mean age was 45.72 years, with extremes of 16 and 80 years old. There was a male predominance, with a sex ratio of 3.36. Farmers and housewives accounted for 75% (72/96) of patients (**Table 1**).

Table 1. Distribution of patients by profession.

Profession	Numbers (n = 96)	Percentage (%)
Farmer	54	56.25
Housewife	18	18.75
Gold digger	13	13.54
Retired	05	5.51
Shopkeeper	03	3.12
Driver	01	1.04
Carpenter	01	1.04
Photographer	01	1.04

- **Clinical and paraclinical data**

- **Pathological history**

History-taking revealed that a patient could have several histories. Thus, 41 (42.71%) had a history of jaundice, 10 (3.12%) of alcohol consumption, and no patient had been vaccinated against hepatitis B virus.

- **Functional signs**

Distension and abdominal pain were the most frequent reasons for hospitalization. The mean duration between the onset of functional signs and hospitalization was 36 days, with extremes of 1 and 240 days. Symptoms on admission were primarily abdominal distension (56.21%), followed by abdominal pain (51.04%) (**Table 2**).

Table 2. Distribution of hospitalization reasons.

Hospitalization reasons	Numbers (n = 96)	Percentage (%)
Abdominal distension	54	56.21
Abdominal pain	49	51.04
Pelvic limb edema	07	07.29
Hematemesis	07	07.29
Altered general condition	05	05.21

General condition was rated WHO Stage 3 in 70 (72.92%) of patients. Of these, 64 (66.67%) had pelvic limb oedema and 62 (64.58%) had jaundice.

- **Physical signs**

Clinical examination revealed hepatomegaly in 44 (45.83%) patients (**Table 3**). Its anterior surface was irregular 75%, of hard consistency 81.82%, with a sharp lower edge 88.64% and portal hypertension in 40.63% of cases. Ascites fluid puncture in 49 (62.82%) patients was citrine yellow in 39 (79.59%), low in protide in 16 (64%) and ascitoculture negative in 92%.

Table 3. Distribution of patients' physical signs.

Physical signs	Number (n = 96)	Frequency (%)
Hepatomegaly	44	45.83
Abdominal distension	77	80.21
Hepatocellular insufficiency	11	11.46
Portal hypertension	39	40.63
Cholestasis	30	31.25
Collateral venous circulation	35	36.46
Splenomegaly	10	10.42

- **Biological parameters**

Biological abnormalities were dominated by cholestasis and hypoalbuminemia.

Table 4 summarizes the biological parameters.

Table 4. Distribution of biological parameters.

Biological tests		Values	Number	Frequency (%)	
Transaminases	ALAT	Normal	23	28.05	
		Once the normal	31	37.80	
		Twice the normal	12	14.63	
		More than or equal to 3 times normal	16	19.52	
	ASAT	Normal	13	15.85	
		Once the normal	16	19.51	
		Twice the normal	14	17.07	
		More than or equal to 3 times normal	39	47.56	
	ASAT/ALAT	<1	08	9.76	
		>1	74	90.24	
	Bilirubinemia	Bil C	Hyperbilirubinemia	61	82.43
		Bil T	Hyperbilirubinemia	61	82.43
Prothrombin rate		under 40	37	47.44	
		40 - 50	13	16.67	
		over 50	28	35.90	
AFP		Normal	7	13.21	
		5 - 500 ng	27	50.94	
		over 500ng	19	35.85	
Albumin		Decreased	53	89.83	
		Normal	6	10.17	
Hemoglobin	Haemoglobin	Anemia	78	83.87	
		Normal	15	16.13	
	White blood cells	Leucopenia	4	5.26	
		Hyperleucocytosis	32	42.11	
	Platelets	Thrombocytopenia	49	52.69	
		Thrombocytosis	02	2.15	
Creatinemia		Normal	79	84.95	
		Renal function impairment	14	15.05	
Blood ionogram		Normal	9	25	
		Hypocalcemia	22	61.11	
		Hyponatremia	15	42.67	
		Hypochloremia	04	11.11	
		Hypokaliemia	03	8.33	
		Hypomagnesemia	02	5.56	

Continued

Viral markers	HBsAg	72	77.42
	HbeAg	04	4.30
	HbeAb	03	3.23
	HBcAb	37	39.78
	HBsAb	05	5.38
	HCVAb	04	4.30

Bil C: Conjugated bilirubin. Bil T: Total bilirubin. AFP alpha foeto protein.

○ **Endoscopic signs**

Upper GI endoscopy was performed on 43 patients and showed esophageal varices grade I, II, III in respectively 6.97%; 51.16%; 30.23% of cases (**Table 5**). Other abnormalities included portal hypertension gastropathy in 41.81%, and bulbar and gastric ulcers in 11.63% and 9.3% respectively.

Table 5. Summary of patients' endoscopic abnormalities.

Endoscopic findings	Number (n = 43)	Frequency (%)	
Esophageal varices	Grade I	03	6.97
	Grade II	22	51.16
	Grade III	13	30.23
Portal hypertension gastropathy	18	41.81	
Bulbar ulcer	05	11.63	
Congestive corporal gastropathy	05	11.63	
Gastric ulcer	04	9.30	
Esophageal mycosis	04	9.30	
Peptic esophagitis	01	2.33	

○ **Complications**

Complications were present in 49 (51.04%) patients, hepatocellular carcinoma in 36 (73.47%), hepatic encephalopathy in 11 (22.45%), digestive hemorrhage and ascites fluid infection in 10.20% each, and hepatorenal syndrome in 6 (12.24%) patients (**Table 6**).

Table 6. Breakdown of complications.

Complications	Number (n = 49)	Frequency (%)
HCC	36	73.47
Hepatic encephalopathy	11	22.45
Digestive hemorrhage	05	10.20
Hepatorenal syndrome	06	12.24
Ascites fluid infection	05	10.20

○ Etiologies of cirrhosis

The etiological investigation found hepatitis B virus in 72 (75%) patients, followed by alcohol in 7.29%. The cause of cirrhosis could not be determined in 11.46% of cases (**Table 7**).

Table 7. Distribution of cirrhosis etiologies.

Etiologies	Number (n = 96)	Percentage (%)
HBV	72	75
Indeterminate	11	11.46
Alcohol	07	7.29
HCV	04	4.17
Toxic	02	2.08

○ Therapeutic data

The therapeutic management of patients in our series was essentially medical, with the use of several classes of drugs. Analgesics and diuretics were the most commonly used, respectively 93.75% and 91.67% (**Table 8**). No patient benefited from endoscopic or surgical treatment. The analgesics used were paracetamol for stage 1 pain, tramadol for stage 2 and morphine sulfate for stage 3 pain. The diuretic treatment strategy was based on spironolactone more or less combined with furosemide in a 10/4 ratio (*i.e.*, 100mg spironolactone to 40 mg furosemide). The beta-blocker available was propranolol, and the antiviral treatment for HBV was tenofovir. For HCV, the molecules were sofosbuvir-velpatasvir or sofosbuvir-daclastavir.

Table 8. Breakdown of patients by types of treatment.

Types of treatment	Number (n = 96)	Frequency (%)
Analgesic	90	93.75
Diuretic	88	91.67
Evacuation puncture	70	72.92
Beta blocker	27	28.13
Antivirals	24	25
Antibiotics	15	15.63
Blood transfusion	06	6.25

○ Evolution and prognosis

Prognostic evaluation using the Child Pugh score was carried out on 67 patients, classifying them as Grade C 55.22%, Grade B 35.82% and A 8.96%.

In our study population, 28.13% of patients were discharged after clinical improvement, and 43.75% died during hospitalization, of which primary liver cancer was the main cause in 52.38%.

4. Discussion

4.1. Limitations and Constraints

Our study was cross-sectional, with retrospective data collection, and its limitations include incomplete or poorly completed medical records. Similarly, the lack of financial resources prevented us from carrying out certain imaging and histological examinations. Incomplete medical records sometimes lead to a significant loss of data, resulting in the exclusion of certain patients from our sample. In addition, as not all paraclinical examinations were carried out on all patients, some calculated proportions are reported for the entire study population, but with missing data.

The diagnosis of cirrhosis was based on a combination of clinical, biological and ultrasound evidence.

4.2. Sociodemographic and Epidemiological Data

The hospital prevalence of cirrhosis was 2.6%. Our result is similar to that of Toure *et al.* in Mali in 2008, who reported a frequency of 2.8% [9], but remains lower than those of Sawadogo *et al.* at Chuss in 2012 and Some *et al.* at Chu Yo in 2021, respectively 5.9% and 33.9% [8] [10]. The low prevalence of cirrhosis in our study could be explained by the low prevalence of hepatitis B in the Nord region. The prevalence of viral hepatitis B was recently estimated at 7%, while the overall prevalence of infection in the country is approximately 9.1% [7].

The mean age was 45.72 years, with extremes of 16 and 80 years. It is similar to those reported by Some *et al.* at Chu Yo in 2021, Tinto *et al.* in Ouagadougou in 2002 and Sawadogo *et al.* at Chuss de Bobo Dioulasso in 2012 in respectively 46.5 years; 46.9 years and 47.5 years [7] [8] [10]. However, our results are lower than those observed in France and America, where the average age is 70 [11]. These observations can be explained by contrasting differences in risk factors and living conditions: in France, cirrhosis is most often diagnosed in the elderly and is linked to alcohol and chronic (metabolic) diseases, whereas in Africa, infection with the hepatitis B virus at an early age is the main cause [12].

Males predominated, with a sex ratio of 3.36. This male predominance was observed by Agbozo *et al.* in Ghana in 2022, with a sex ratio of 3.1. [13]; of Terefe T *et al.* in 2019 in Ethiopia with 3.54 [11]; Toure in Mali (4.7) [9] as well as Driouiche *et al.* in Morocco (1.19) [14]. In Burkina Faso, the same observation was reported by Sawadogo in Bobo-Dioulasso [8] and Some *et al.* in Ouagadougou [10] with sex ratios of 2.3 and 2.7 respectively. This male tendency could be explained in part by men's risky behaviours, such as alcohol and tobacco consumption.

The data we report on cirrhosis at an epidemiological level may reflect under-reporting of cirrhosis and could only be generalized in the context of resource-limited countries. Indeed, we report 96 cases of documented cirrhosis in 3 years in our hospital, whereas worldwide, compensated cirrhosis is estimated to have a prevalence of 112 million patients, with a ratio of 1395 cases per 100,000 inhabitants (1, 17). This could be explained by the fact that teaching hospitals are not the

first level of care in our country, and only patients who are financially accessible and have accepted the health referral are admitted. Moreover, ascetic cirrhosis is perceived by our populations as a pejorative disease of mystical origin, whose treatment is mainly traditional and requires recourse to traditional healers.

4.3. Medical History

In both our study and that of Some *et al.* [10], none of the patients had been vaccinated against the hepatitis B virus, the only effective method of preventing hepatitis B infection. This situation could be due either to the inaccessibility of the vaccine due to its high cost, or to insufficient awareness-raising campaigns on the necessity and importance of vaccination.

4.4. Consultation Period

The average delay between the onset of functional signs and hospitalization was 36 days, with extremes ranging from 1 to 240 days. This long delay was also reported by Abgozo *et al.* in Ghana, which was 35 days [13].

Some *et al.* in 2021 found an even longer average delay of 99 days [10]. These relatively long delays may be linked to several factors. Firstly, a misperception of the severity of the disease, linked to the insidious onset of abdominal distension and the absence of pain. Secondly, the traditional misperception of abdominal distension as a “curse” that cannot be treated by modern medicine, justifying late recourse to medical care. Finally, there is geographical inaccessibility in certain areas due to the security crisis.

4.5. Clinical Data

Abdominal distension (56.21%) and pain (51.04%) were the main reasons for hospitalization. Our data corroborate those of Agbozo *et al.* in Ghana in 2022, who reported abdominal distension in 94.37% of cases and pain in 86.25% [13]. Ndow *et al.* in Gambia in 2023 observed the same symptoms in 60% of patients admitted for cirrhosis [15]. These reasons for hospitalization suggest the decompensation of cirrhosis, and testify to the late consultation of patients.

The majority of patients in our series (51.04%) were admitted at the complication stage. Hepatocellular carcinoma was the most common complication, accounting for 73.47%. Sawadogo *et al.* made the same observation in Bobo Dioulasso [8]. On the other hand, Driouiche *et al.* in Morocco reported digestive haemorrhage as the primary complication in 51% of cases [14]. The insidious progression of cirrhosis, together with late detection of esophageal varices and prophylactic treatment against rupture, explains why patients are seen at the complication stage.

Hepatitis B virus remains the most common etiology of cirrhosis in our setting, with a prevalence of 75%. This etiological profile is similar to the findings of the Global Burden of Disease 2017, which highlights the high prevalence of post-viral B cirrhosis in Africa (5% to 7%) [11]. Similarly, Toure in Mali [9]; Some *et al.* in

Ouagadougou [16] and Ndow *et al.* in Gambia reported a prevalence of hepatitis B of 73.91%, 76.5% and 75% respectively. These results differ from those in Europe and America, where chronic alcoholism is the main etiology of cirrhosis (60%) [2] [17].

The high prevalence of hepatitis B as the main cause of cirrhosis in sub-Saharan Africa could be explained by mother-to-child transmission, combined with limited access to vaccines and antiviral treatments. Indeed, hepatitis B vaccination was not included in the Expanded Program on Immunization in our context until 2006.

4.6. Treatment

The main objective of the treatments received by the patients in our study was essentially based on managing complications and improving their quality of life.

None of our patients received endoscopic treatment for esophageal varices or liver transplantation. Only drugs normally used in the management of cirrhosis were administered. Our results are similar to those of Sawadogo in Bobo-Dioulasso [8], Toure in Mali [9] and Driouche *et al.* in Morocco [14].

Since the major etiology of cirrhosis in our country is HBV, the most effective treatment remains prevention through vaccination. This vaccination, which has been effective in our country for children since 2006, should be intensified and extended to the adult population through awareness, screening and vaccination campaigns. In addition, this community awareness campaign should take into account the socio-cultural constraints that hinder the management of ascetic decompensation of cirrhosis. In addition, training specialist doctors and assigning them to primary care centers could further improve patient care. Another salutary intervention of health policies would be the adequate equipping of health centers. Our hospitals lack the resources needed to care for patients. For example, our patients have not benefited from esophageal varicose vein ligations. For the management of complications of portal hypertension, vasoactive drugs such as glypressin or octreotide are not available. Radiological techniques such as TIPS, radiofrequency and chemoembolization are not feasible, nor is liver transplantation.

4.7. Prognostic Evolution

Treatment resulted in remission of symptoms in 28.13% of cases. On the other hand, death occurred in 43.75% of cases, the main cause of which was primary liver cancer in 52.38% of cases. Our results are similar to those of Sawadogo W.A. in Bobo, who reported mortality due to hepatocellular carcinoma in 50% of cases [8].

5. Conclusion

Cirrhosis is a frequent reason for hospitalization in our hospital, affecting the active adult population. Patients are present at a stage of decompensation or complications of the disease. Viral hepatitis B and C and alcohol are the main causes.

Mortality remains high despite treatment. Efforts must be made for screening, vaccination and mass treatment campaigns to reduce the prevalence and prognosis of cirrhosis in our community. Hope lies in the expected fruits of universal childhood vaccination, which began in our country in 2006.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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