KESMONDS INTERNATIONAL UNIVERSITY
Entrepreneurial & Skilled Education for the Future
IQ RESEARCH JOURNAL
www.iqresearchjournal.com
KESMONDS RESEARCH INSTITUTE

Volume 5, Issue 2 - MAY 2026

IQ RESEARCH

A Quaterly Journal

ISSN: 2790-4296 (Online)
ISBN: 978-9956-504-74-9 (Print)
Published by IQRJ publications
www.iqresearchjournal.com

Entrepreneurial Education for a Changing Society

IQ RESEARCH JOURNAL
www.iqresearchjournal.com

KESMONDS RESEARCH INSTITUTE

EDITORIAL BOARD

Table of Contents

Entrepreneurial Education for a Changing Society

IQ RESEARCH JOURNAL
www.iqresearchjournal.com

KESMONDS RESEARCH INSTITUTE

Original Article IQRJ: Volume 005, Issue 002, May 2026 www.iqresearchjournal.com

Received : 20/02/2026___Revised : 20/04/2026___Accepted : 30/04/2026___Published : 02/05/2026

The Assessment of Methods Used to diagnose Hepatocellular Carcinoma to the 396 decompensated cirrhotic patients at the Bertoua Regional Hospital

Olivier Lieuga[a] ,Tatiana Jiengoué[a] and Augustine Nji Asakizi[aa]

Affiliations

a. [a] School of Health and Biomedical Sciences, Kesmonds International University of America

Corresponding Author:

Olivier Lieuga

Email:
olivierlieuga@kesmondsuniversity.org

Paper ID: IQRJ-V05I02-26005017

ABSTRACT

Introduction: Hepatocellular carcinoma (HCC) is diagnosed primarily through non-invasive, contrast-enhanced imaging techniques based on tumor vascularity. these methods include multiphasic contrast-enhanced MRI (preferred for high sensitivity) and CT scans, along with contrast-enhanced ultrasound (CEUS). Diagnostic algorithms often incorporate blood biomarkers like Alpha-fetoprotein (AFP) and liver biopsy for atypical cases, often categorized using the LI-RADS system.

Methods: It is descriptive cross – sectional study done on 396 patients living with decompensated cirrhosis recorded at the Intensive Care Unit of Bertoua Regional Hospital from June to October 2025 to diagnose Hepatocellular Carcinoma, after receiving ethical clearance and Research Authorization from Est Public Health Delegation – Cameroon. Convenience sampling was done. The analysis included the methods such as GALAD Score, Fibrotest – Actitest Score, CT Scans, LFTs, APHE, LIRADS, Multiphase CT Scan and Dicckof – 1.

Results: Out to 396 Cirrhosis patients, the prevalence rate of HCC obtained was 68,43%.

Conclusions: At the end of our studies, 68.63% of the 396 patients with liver cirrhosis underwent the following examinations: multiphasic computed tomography (CT) scan, multiphasic magnetic resonance imaging (MRI), FibroScan, FibroTest, Actitest, and AFP testing to confirm the diagnosis of hepatocellular carcinoma (HCC). The absence of other examinations, such as AFP-L3, DCP, Dickkoff-1, and BCLC liver biopsy, does not always allow for the determination of the cancer stage (stage 0, stage A, stage B, stage C, and stage D) and raises concerns about the quality of treatment.

Keywords : *Hepatocellular Carcinoma, Liver Cirrhosis , Hepatitis B, Hepatitis C*

1. INTRODUCTION

Hepatocellular Carcinoma (HCC) is a higher aggressive malignancy with global impact, especially in the context of the rising epidemic of metabolic dysfunction associated with chronic hepatitis, Emily Kinsey and Hannah M. Lee (2024). It is noted that liver cancer is the sixth most common cancer, but its aggressive nature and poor prognosis raise it to the third highest cause of cancer related deaths. Hepatocellular Carcinoma (HCC) makes up approximately 75% of primary liver cancer cases, with a smaller proportion due to Cholangiocarcinoma, Baffy G (2016).

Hepatocellular Carcinoma (HCC) is the fourth leading cause of cancer related mortality Worldwide and a leading cause of death in cirrhosis, Previn Ganesan and Laura M.Kulik (2023).The prognosis in HCC is poor, with mortalities approximating incidence rates Worldwide. The second leading cause of cancer death after lung cancer in men is HCC, Jemal A, Ward EM, Johnson CJ et al (2014). Considered as a primary tumor of the liver, HCC occurs in approximately 85% of patients diagnosed with cirrhosis caused either by viral hepatitis infection, or metabolic dysfunction, Semmler G and Mandofer (2022). The Global burden of HCC is highest in Asia and Sub-Saharan Africa due to the high prevalence of chronic hepatitis in those regions. Men are more commonly affected and have a higher mortality than Women, with liver cancer being the leading cause of cancer death among men in over 20 countries, Emily Kinsey and Hannah M. Lee (2024)

HCC account for one third of total cancer incidence and mortality in developing countries, Ahmad Zia Shms and Ulrike Haug (2017). To date, there is no systematic synthesis of evidence regarding strategies to prevent HCC in developing countries. The epidemiology of HCC is rapidly evolving with chronic liver disease becoming an increasing cause of fibrosis, cirrhosis and HCC, Previn Ganesan and Laura M. Kulik (2022). Most patients develop HCC in the setting of Cirrhosis, and the risk factors for HCC include Hepatitis B (HBV), Hepatitis C (HCV), alcohol related liver disease (ALD), and excess body weight, and type 2 diabetes, with is often associated metabolic dysfunction associated with steatotic liver disease (MASLD), as well as aflatoxin exposure, Ahmad Zia Shms (2023). The prevalence of various risk factors for HCC is region specific with viral causes being more common in the East and non - viral etiologies in the West. In Japan and Egypt, HCV is the primary driver of HCC, Venook AP, Papandreouc et al (2010). In Asia and Africa, Chronic HBV is a primary cause of HCC.

2. RELATED WORKS

Multiphase CT or MRI with contrast is used for definitive diagnosis of HCC; arterial phase enhancement (APHE); and washout on the portal venous phase. The Liver Reporting and Data System (LIRADS) allows for the classification of liver lesions in cirrhosis in a standardized manner, Marasco G, Alemanni LV, Coleechia A, et al (2021). Multiphase MRI may have higher sensitivity but comparable specificity to CT. Imaging is often sufficient to definitively diagnose HCC (LIRADS-5), eliminating the need for a biopsy for diagnostic purposes, Allaire M, Goumard C, Lim C, Le cleach A, Wagner M and Sertton O (2020). However, when imaging findings are nondiagnostic but highly suspicious for HCC (LIRADS-4), clinicians may repeat an imaging study in 3 months, attempt the alternative imaging modality, or consider pursuing a biopsy for definitive diagnosis, Cittero D, Faccidrusso A, Sposito C, Rota R,

Ghouri S, and Mazzaferro V (2016). The advantages of CT include shorter duration of examination and lower cost. The disadvantages include exposure to radiation and iodinated contrast. This is especially relevant in individuals with advanced liver disease who can often have concurrent renal dysfunction, Azoulay D, Ramos E, Casellas – Robert M, et al (2020).

Hepatocellular carcinoma can be diagnosed on the basis of validated imaging criteria (in people who have liver cirrhosis) or tissue biopsy. Commonly used imaging modalities include multiphasic CT or MRI, in which hepatocellular carcinoma typically shows enhancement (brightness compared with surrounding parenchyma) in the early arterial phase, and washout (temporal decrease in enhancement relative to surrounding parenchyma) in the delayed phase, Marasco G, Alemanni LV, ColeechiaA, et al (2021). The latter creates a peripheral rim of enhancement around the tumour, resulting in the formation of a capsule; an observation highly specific for hepatocellular carcinoma, Kabir T, Tan ZZ, Syn NL et al (2021). This imaging feature has been prospectively confirmed and universally adopted by guidelines.

Usually, solid hepatic nodules raise suspicion for hepatocellular carcinoma once they are ≥1 cm, especially in patients with liver cirrhosis. Lesions that are identified incidentally or through regular screening by ultrasound, dynamic contrast-enhanced CT or MRI of the abdomen should be obtained for further assessment, Lang H, Sotiropoulos GC, Domland M et al (2005). Pathological diagnosis of hepatocellular carcinoma is typically based on the examination of a resection or explant specimen, or from a biopsy sample.

Historically, biopsy has been reserved for lesions in which non-invasive imaging criteria for diagnosis are not met or are not applicable (for patients without cirrhosis), Reig M, Former A, Rimola J et al (2022). The prognosis for hepatocellular carcinoma depends not only on tumour characteristics, such as tumour burden, extrahepatic spread, vascular infiltration, or tumour differentiation, but is heavily influenced by the underlying liver disease, Chen LT Martinelli E, Cheng AL et al (2021). Additionally, higher levels of serum AFP are significantly associated with increased mortality, independent of demographic and clinical factors or treatment, and have been shown to predict the risk of tumour recurrence after resection and liver transplantation, Kudo M, Kawamura Y, Hasegawa K et al (2021).

3. MATERIALS & METHODS

It is descriptive cross – sectional study done on 396 patients living with decompensated cirrhosis recorded at the Intensive Care Unit of Bertoua Regional Hospital from June to October 2025 to diagnose Hepatocellular Carcinoma, after receiving ethical clearance and Research Authorization from Est Public Health Delegation – Cameroon. Convenience sampling was done. The analysis included the methods such as GALAD Score, Fibrotest – Actitest Score, CT Scans, LFTs, APHE, LIRADS, Multiphase CT Scan and Dickof – 1.

Convenience sampling was done, all the cases of elective HCC admitted during the study period were included. Age > 20, men and women, Cameroonians or not but residents in Cameroon. The simple size was 271 patients calculated was calculated using the formula n = (Z2 x p x q) / e2 where n = minimum sample size, z= confidence interval, p= prevalence of decompensated cirrhosis, q= 1 – p and e= margin of error, 3%.

The data for this study were collected using structured questionnaires, entered and analysed in Microsoft Excel 2016, confidence interval was calculated along with frequency and percentages for binary data

4. RESULTS & DISCUSSION

The Assessment of Methods Used to diagnose Hepatocellular Carcinoma to the 396 decompensated cirrhotic patients at the Bertoua Regional Hospital among which we analyzed these characteristics on each patient and are summarized them by the tables.

[See Annex — Table 1: Hepatocellular Carcinoma Patient Characteristics]

[See Annex — Table 2 : Results of Exams/Tests done for the diagnostic of HCC]

[See Annex — Table 3 : Results of Exams/Tests done for the diagnostic of HCC]

At the end of our studies, 68.63% of the 396 patients with liver cirrhosis underwent the following examinations: multiphase CT scan, multiphase MRI, FibroScan, FibroTest, Actitest, and AFP to confirm the diagnosis of HCC. The absence of other examinations such as AFP-L3, DCP, Dickkoff-1, and liver biopsy using the BCLC method does not always allow for the determination of the cancer stage (Stage 0, Stage A, Stage B, Stage C, and Stage D). This leaves some ambiguity regarding treatment. We also noted that the GALAD score remained unavailable due to the unavailability of two tests (AFP-L3 and DCP) in local laboratories. Another identified factor is the low income of some patients, who are unable to afford these expensive examinations in both local and foreign laboratories. Diagnosing hepatocellular carcinoma (HCC) in decompensated cirrhotic patients is a complex, high-stakes process that relies heavily on advanced, non-invasive imaging, as liver function is too compromised for routine biopsies, Johnson PJ et al,…(2021). While conventional ultrasound is used for surveillance, it lacks the sensitivity needed for definitive diagnosis in advanced liver disease, often requiring follow-up with multiphasic computed tomography (CT) or magnetic resonance imaging (MRI), Boyles TH et al,..(2011). It also involves using contrast-enhanced MRI or CT to identify arterial phase hyperenhancement and venous washout, with MRI offering superior sensitivity. Guidelines emphasize leveraging LI-RADS for standardized imaging, with liver biopsy reserved for inconclusive cases, Bruix J et al,..(2021).

5. CONCLUSION

We recommended that the hospital improve its diagnostic equipment for HCC, seek funding from NGOs to provide free or subsidized care for underprivileged patients, and recruit specialists such as gastroenterologists, digestive surgeons, and digestive oncologists.

REFERENCES

Jonas M, Kelly DA, Mizerski J, et al. Clinical trial of lamivudine in children with chronic hepatitis B. N Engl J Med 2002;346:1706–13.

Lai CL, Lin HJ, Lau HJ, et al. Effect of recombinant a2 IFN with or without prednisolone in Chinese HBsAg carrier children. QJM 1991;78:155–63.

Bortolotti F, Jara P, Barbera C, et al. Long term effect of a interferon in children with chronic hepatitis B. Gut 2000; 46:715–8

Lampertico P, Del Ninno E, Vigano M, et al. Long term suppression of HBeAg negative chronic hepatitis B by 24 months’ interferon therapy. Hepatol 2003;37:756–63.

Kasper D.L., Fauci A.S., Longo D.L, et al: Harrison’s principles of internal medicine. 16th edition. 2005.

Keeffe EB, Dieterich DT, Han SH, Jacobson IM, Martin P, Schiff ER, et al. A treatment algorithm for the management of chronic hepatitis B virus infection in the United States: 2008 update. Clin Gastroenterol Hepatol. Dec 2008;6(12):1315-41; quiz 1286.

Chen CJ, Yang HI, Iloeje UH. Hepatitis B virus DNA levels and outcomes in chronic hepatitis B. Hepatology. May 2009;49(5 Suppl):S72-84

Fattovich G, Stroffolini T, Zagni I, et al. Hepatocellular carcinoma in cirrhosis: incidence and risk factors. Gastroenterology 2004; 127(Suppl 1):S35–S50.

McMahon BJ, Alberts SR, Wainwright RB, et al. Hepatitis B-related sequelae. Prospective study in 1400 hepatitis B surface antigenpositive Alaska native carriers. Arch Intern Med 1990;150:1051– 1054.

Mizokami M, Orito E. Molecular evolution of hepatitis viruses. Intervirology 1999;42:159–165

Tanaka Y, Kurbanov F, Mano S, et al. Molecular tracing of the global hepatitis C virus epidemic predicts regional patterns of hepatocellular carcinoma mortality. Gastroenterology 2006;130: 703–714.

El-Serag HB, Rudolph KL. Hepatocellular carcinoma: epidemiology and molecular carcinogenesis. Gastroenterology 2007;132: 2557–2576.

Chang MH. Hepatitis B virus and cancer prevention. Recent Results Cancer Res 2011;188:75–84

Fattovich G, Bortolotti F, Donato F. Natural history of chronic hepatitis B: special emphasis on disease progression and prognostic factors. J Hepatol 2008;48:335–352

Yang JD, Kim WR, Coelho R, et al. Cirrhosis is present in most patients with hepatitis B and hepatocellular carcinoma. Clin Gastroenterol Hepatol 2011;9:64–70

Yang HI, Lu SN, Liaw YF, et al. Hepatitis B e antigen and the risk of hepatocellular carcinoma. N Engl J Med 2002;347:168–174

Chen CJ, Yang HI, Iloeje UH. Hepatitis B virus DNA levels and outcomes in chronic hepatitis B. Hepatology 2009;49(Suppl): S72–S84.

Chun HM, Roediger MP, Hullsiek KH, et al. Hepatitis B Virus Coinfection Negatively Impacts HIV Outcomes in HIV Seroconverters. The Journal of Infectious Diseases. 2012;205(2):185-193. doi:10.1093/infdis/jir720

McMahon BJ. The natural history of chronic hepatitis B virus infection. Hepatology. 2009;49(5 Suppl):S45-55 2.

Schweitzer A,Horn J, Mikolajczyk RT, Krause G, Ott JJ Estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2013.

Lancet 2015; 386: 1546–55 3. Ott J, Stevens G, Groeger J, Wiersma S. Global epidemiology of Hepatitis B virus infection: new estimates of age-specific HBsAg seroprevalence and endemicity. Vaccine 2012;30(12): 2212–9 4.

Lukhwareni A, Burnett RJ, Selabe SG, Mzileni MO, Mphahlele MJ. Increased detection of HBV DNA in HBsAg-positive and HBsAgnegative SouthAfrican HIV/AIDS patients enrolling for Highly active antiretroviral therapy at a Tertiary Hospital. J Med Virol 2009;81(3):406–12 5.

Boyles TH, Cohen K. The prevalence of hepatitis B infection in a rural SouthAfrican HIV clinic. S Afr Med J 2011;101(7):470–1 6.

Firnhaber C, Reyneke A, Schulze D, et al. The prevalence of hepatitis B co-infection in a South African urban government HIV clinic. S Afr Med J 2008;98(7):541-4 7.

Burnett RJ, Ngobeni JM, Francois G, et al. Increased exposure to hepatitis B virus infection in HIV-positive South African antenatal women. Int J STD AIDS 2007;18(3):152–6 8.

Andersson MI, Maponga TG, Ijaz S, et al. The epidemiology of hepatitis B virus infection in HIV-infected and HIV-uninfected pregnant women in the Western Cape, South Africa. Vaccine 2013;31(47):5579-84 9.

Puoti M1, Torti C, Bruno R, Filice G, Carosi G. Natural history of chronic hepatitis B in co-infected patients. J Hepatol 2006; 44(1 Suppl):S65-70 10.

Maynard JE. Hepatitis B: Global importance and need for control. Vaccine 1990;8(SUPPL.):S18-S20

Mohd Hanafiah K, Groeger J, Flaxman AD, Wiersma ST. Global epidemiology of hepatitis virus infection: new estimates of age-specific antibody to HCV seroprevalence. Hepatology 2013;57(4):1333-42

Lavanchy D. The global burden of hepatitis C. Liver Int. 2009;29 Suppl 1:74-Ellis LA, Brown D, Conradie JD, Paterson A, Sher R, Millo J, et al. Prevalence of hepatitis C inSouth Africa: detection of anti-HCV in recent and stored serum. J Med Virol 1990;32(4):249- 51

Davis GL. Hepatitis C virus genotypes and quasispecies. Am J Med 1999;107(6B):21S-6S

Messina JP, Humphreys I, Flaxman A, et al. Global distribution and prevalence of hepatitis C virus genotypes. Hepatology. 2015;61(1):77–87

Benova L, Mohamoud YA, Calvert C, AbuRaddad LJ. Vertical transmission of hepatitis C virus: systematic review and meta-analysis. Clin Infect Dis. 2014;59(6):765–73

Floreani A. Hepatitis C and pregnancy. World J Gastroenterol. 2013;19(40):6714–20 Jafari S, Copes R, Baharlou S, Etminan M, Buxton J. Tattooing and the risk of transmission of hepatitis C: a systematic review and metaanalysis. Int J Infect Dis.2010;14(11):E928– E9

Nelson PK, Mathers BM, Cowie B, et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: results of systematic reviews. Lancet. 2011;378(9791):571–83

Zein CO, Levy C, Basu A, Zein NN. Chronic hepatitis C and type II diabetes mellitus: a prospective cross-sectional study. Am J Gastroenterol. 2005;100(1):48-5

EASL Recommendations on Treatment of Hepatitis C 2018. J Hepatol 2018; 69(2): 461- 511

Smith JO, Sterling RK. Systematic review: non-invasive methods of fibrosis analysis in chronic hepatitis C. Alimentary pharmacology & therapeutics. 2009;30(6):557-76

Karmochkine M, Carrat F, Dos Santos O, Cacoub P, Raguin G. A case-control study of risk factors for hepatitis C infection in patients with unexplained

routes of infection. J Viral Hepat. 2006;13(11):775–82

Nelson PK, Mathers BM, Cowie B, et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: results of systematic reviews. Lancet. 2011;378(9791):571–83

Lau GK, Piratvisuth T, Luo KX, Marcellin P, Thongsawat S, et al. (2005) Peginterferon Alfa-2a, lamivudine, and the combination for HBeAgpositive chronic hepatitis B. N Engl J Med 352: 2682-2695. 2.

Conjeevaram HS, Lok AS (2003) Management of chronic hepatitis B. J Hepatol 38 Suppl 1: S90-103.

Karayiannis P (2003) Hepatitis B virus: old, new and future approaches to antiviral treatment. J Antimicrob Chemother 51: 761-785.

Wellington K, Jarvis B (2001) Silymarin: a review of its clinical properties in the management of hepatic disorders. BioDrugs 15: 465-489.

Strader DB, Bacon BR, Lindsay KL, La Brecque DR, Morgan T, et al. (2002) Use of complementary and alternative medicine in patients with liver disease. Am J Gastroenterol 97: 2391-2397.

Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, et al. (1998) Trends in alternative medicine use in the United States, 1990-1997: results of a follow-up national survey. JAMA 280: 1569-1575.

Flora K, Hahn M, Rosen H, Benner K (1998) Milk thistle (Silybum marianum) for the therapy of liver disease. Am J Gastroenterol 93: 139-143.

Varga Z, Czompa A, Kakuk G, Antus S (2001) Inhibition of the superoxide anion release and hydrogen peroxide formation in PMNLs by flavonolignans. Phytother Res 15: 608-612.

Dehmlow C, Erhard J, de Groot H (1996) Inhibition of Kupffer cell functions as an explanation for the hepatoprotective properties of silibinin. Hepatology 23: 749-754

Wilasrusmee C, Kittur S, Shah G, Siddiqui J, Bruch D, et al. (2002) Immunostimulatory effect of Silybum Marianum (milk thistle) extract. Med Sci Monit 8: BR439-443.

Neumann UP, Biermer M, Eurich D, Neuhaus P, Berg T (2010) Successful prevention of hepatitis C virus (HCV) liver graft reinfection by silibinin mono-therapy. J Hepatol 52: 951-952.

Beinhardt S, Rasoul-Rockenschaub S, Maieron A, PH S-M, Hofer H PF (2012) Intravenous Silibinin-therapy in patients with chronic hepatitis C in the transplant setting. J Hepatology 56: S77.

Pares A, Planas R, Torres M, Caballeria J, Viver JM, et al. (1998) Effects of silymarin in alcoholic patients with cirrhosis of the liver: results of a controlled, double-blind, randomized and multicenter trial. J Hepatol : 615-621.

Sepanlou SG, Safiri S, Bisignano C, et al; GBD 2017 Cirrhosis Collaborators. The global, regional, and national burden of cirrhosis by cause in 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. Lancet Gastroenterol Hepatol. 2020;5(3):245-266. doi:10.1016/S2468-1253(19)30349-8

Tapper EB, Parikh ND. Mortality due to cirrhosis and liver cancer in the United States, 1999-2016. BMJ. 2018;362:k2817. doi:10.1136/bmj.k2817

Centers for Disease Control and Prevention. CDC WONDER: about provisional mortality statistics, 2018 through last month. Accessed March 13, 2023. https://wonder.cdc.gov/mcd-icd10-provisional.html

Serper M, Kaplan DE, Taddei TH, Tapper EB, Cohen JB, Mahmud N. Nonselective beta blockers, hepatic decompensation, and mortality in cirrhosis: a national cohort study. Hepatology. 2023;77(2):489-500. doi:10.1002/hep.32737

Flemming JA, Dewit Y, Mah JM, Saperia J, Groome PA, Booth CM. Incidence of cirrhosis in young birth cohorts in Canada from 1997 to 2016: a retrospective population-based study. Lancet Gastroenterol Hepatol. 2019;4(3):217-226. doi:10.1016/S2468-1253(18)30339-X

Hirode G, Saab S, Wong RJ. Trends in the burden of chronic liver disease among hospitalized US adults.JAMA Netw Open. 2020;3(4):e201997-e201997. doi:10.1001/jamanetworkopen.2020.1997

Foster C, Baki J, Nikirk S, Williams S, Parikh ND, Tapper EB. Comprehensive health-state utilities in contemporary patients with cirrhosis. Hepatol Commun. 2020;4 (6):852-858. doi:10.1002/hep4.1512

Asrani SK, Hall L, Hagan M, et al. Trends in chronic liver disease-related hospitalizations: a population-based study. Am J Gastroenterol. 2019;114(1):98-106. doi:10.1038/s41395-018- 0365-4

Tarao K, Nozaki A, Ikeda T, et al. Real impact of liver cirrhosis on the development of hepatocellular carcinoma in various liver diseases-meta-analytic assessment. Cancer Med. 2019;8(3):1054-1065. doi:10.1002/cam4.1998

Carbonell N, Pauwels A, Serfaty L, Fourdan O, Lévy VG, Poupon R. Improved survival after variceal bleeding in patients with cirrhosis over the past two decades. Hepatology. 2004;40(3):652-659. doi: 10.1002/hep.20339

Arvaniti V, et al. Infections in patients with cirrhosis increase mortality four fold and should be used in determining prognosis. Gastroenterology 2010;139:1246-1256.

Berzigott A., et al. Obesity is an independent risk factor for clinical decompensation in patients with cirrhosis. Hepatology 2011;54:555-561.

Dienstag J.L., et al. A prospective study of progression in compensated, histologically advanced chronic hepatitis C. Hepatology 2011;54:396-405.

Durand F, et al. Assessment of the prognosis of cirrhosis: Child-Pugh versus MELD. Journal of Hepatology2005;42.

Franchis de, et al. Non-invasive diagnosis of cirrhosis and the natural history of it complications. Best

Practice & Research Clinical Gastroenterology 2007;21(1):3-18.

Friedman SL. Mechanisms of hepatic fibrogenesis. Gastroenterology 2008;134:1655-1669.

Garcia-Tsao G, et al. Management and treatment of patients with cirrhosis and portal hypertension: recommendations from the Department of Veterans Affairs Hepatitis C Resource Center Program and the National Hepatitis C program. The American Journal of Gastroenterology 2009;104(7):1802-1829

Greenbaum L.E. and Wells R.G. The role of stem cells in liver repair and fibrosis. The International Journal of Biochemistry and Cell Biology 2011;43:222-229.

Jiao J, et al. Hepatic fibrosis. Current Opinion in Gastroenterology 2009;25(3):223-229.

Kanwal F, et al. An explicit quality indicator set for measurement of quality of care in patients with cirrhosis. Clinical Gastroenterology and Hepatology 2010;8:709

Sung H, Ferlay J, Siegel RL, et al. Global Cancer Statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2021; 71: 209–49.

Siegel RL, Miller KD, Fuchs HE, Jemal A. Cancer statistics, 2022. CA Cancer J Clin 2022; 72: 7–33. 3 Petrick JL, Florio AA, Znaor A, et al. International trends in hepatocellular carcinoma incidence, 1978–2012. Int J Cancer 2020; 147: 317–30.

Sun J, Althoff KN, Jing Y, et al. Trends in hepatocellular carcinoma incidence and risk among persons with HIV in the US and Canada, 1996–2015.

JAMA Netw Open 2021; 4: e2037512. 5 Chen T, Liu J, Li Y, Wei S. Burden of disease associated with dietary exposure to aflatoxins in China in 2020. Nutrients 2022; 14: 1027.

Romano A, Angeli P, Piovesan S, et al. Newly diagnosed hepatocellular carcinoma in patients with advanced hepatitis C treated with DAAs: a prospective population study. J Hepatol 2018; 69: 345–52.

Dave S, Park S, Murad MH, et al. Comparative effectiveness of entecavir versus tenofovir for preventing hepatocellular carcinoma in patients with chronic hepatitis B: a systematic review and meta-analysis. Hepatology 2021; 73: 68–78.

Papatheodoridis GV, Idilman R, Dalekos GN, et al. The risk of hepatocellular carcinoma decreases after the first 5 years of entecavir or tenofovir in Caucasians with chronic hepatitis B. Hepatology 2017; 66: 1444–53.

Chiang CJ, Yang YW, You SL, Lai MS, Chen CJ. Thirty-year outcomes of the national hepatitis B immunization program in Taiwan. JAMA 2013; 310: 974–76.

Kanwal F, Kramer JR, Asch SM, Cao Y, Li L, El-Serag HB. Long-term risk of hepatocellular carcinoma in HCV patients treated with direct acting antiviral agents. Hepatology 2020; 71: 44–55.

Kim HY, Lampertico P, Nam JY, et al. An artificial intelligence model to predict hepatocellular carcinoma risk in Korean and Caucasian patients with chronic hepatitis B. J Hepatol 2022; 76: 311–18.

Kim HS, Yu X, Kramer J, et al. Comparative performance of risk prediction models for hepatitis B-related hepatocellular carcinoma in the United States. J Hepatol 2022; 76: 294–301.

Zheng J, Seier K, Gonen M, et al. Utility of serum inflammatory markers for predicting microvascular invasion and survival for patients with hepatocellular carcinoma. Ann Surg Oncol 2017; 24: 3706–14.

Johnson PJ, Dhanaraj S, Berhane S, Bonnett L, Ma YT. The prognostic and diagnostic significance of the neutrophil-tolymphocyte ratio in hepatocellular carcinoma: a prospective controlled study. Br J Cancer 2021; 125: 714–16.

Bruix J, Cheng AL, Meinhardt G, Nakajima K, De Sanctis Y, Llovet J. Prognostic factors and predictors of sorafenib benefit in patients with hepatocellular carcinoma: analysis of two phase III studies. J Hepatol 2017; 67: 999–1008.

Scheiner B, Pomej K, Kirstein MM, et al. Prognosis of patients with hepatocellular carcinoma treated with immunotherapy—development and validation of the CRAFITY score. J Hepatol 2022; 76: 353–63. 87 Vogel A, Martinelli E, ESMO Guidelines Committe. Updated treatment recommendations for hepatocellular carcinoma (HCC) from the ESMO Clinical Practice guidelines. Ann Oncol 2021; 32: 801–05.

Bruix J, Chan SL, Galle PR, Rimassa L, Sangro B. Systemic treatment of hepatocellular carcinoma: an EASL position paper. J Hepatol 2021; 75: 960–74.

The International Liver Cancer Association. ILCA systemic therapy guidance. https://ilca-online.org/wp-content/uploads/2020/06/Systemic-therapy-guidelines-V1.2.pdf (accessed July 26, 2022).

Kudo M, Kawamura Y, Hasegawa K, et al. Management of hepatocellular carcinoma in Japan: JSH consensus statements and recommendations 2021 update. Liver Cancer 2021; 10: 181–223.

Chen LT, Martinelli E, Cheng AL, et al. Pan-Asian adapted ESMO clinical practice guidelines for the management of patients with intermediate and advanced/relapsed hepatocellular carcinoma: a TOS-ESMO initiative endorsed by CSCO, ISMPO, JSMO, KSMO, MOS and SSO. Ann Oncol 2020; 31: 334–51.

Reig M, Forner A, Rimola J, et al. BCLC strategy for prognosis prediction and treatment recommendation: the 2022 update. J Hepatol 2021; 76: 681–93.

Lang H, Sotiropoulos GC, Dömland M, et al. Liver resection for hepatocellular carcinoma in non-cirrhotic liver without underlying viral hepatitis. Br J Surg 2005; 92: 198–202.

Viganò L, Conci S, Cescon M, et al. Liver resection for hepatocellular carcinoma in patients with metabolic

syndrome: a multicenter matched analysis with HCV-related HCC. J Hepatol 2015; 63: 93–101.

Kabir T, Tan ZZ, Syn NL, et al. Laparoscopic versus open resection of hepatocellular carcinoma in patients with cirrhosis: meta analysis. Br J Surg 2021; 109: 21–29. 96 Ivanics T, Claasen MP, Patel MS, et al. Long-term outcomes of laparoscopic liver resection for hepatocellular carcinoma: a propensity score matched analysis of a high-volume North American center. Surgery 2021; 171: 982–91.

Berzigotti A, Reig M, Abraldes JG, Bosch J, Bruix J. Portal hypertension and the outcome of surgery for hepatocellular carcinoma in compensated cirrhosis: a systematic review and meta - analysis. Hepatology 2015; 61: 526–36.

Berardi G, Morise Z, Sposito C, et al. Development of a nomogram to predict outcome after liver resection for hepatocellular carcinoma in Child-Pugh B cirrhosis. J Hepatol 2020; 72: 75–84.

Azoulay D, Ramos E, Casellas-Robert M, et al. Liver resection for hepatocellular carcinoma in patients with clinically significant portal hypertension. JHEP Rep 2020; 3: 100190.

Citterio D, Facciorusso A, Sposito C, Rota R, Bhoori S, Mazzaferro V. Hierarchic interaction of factors associated with liver decompensation after resection for hepatocellular carcinoma. JAMA Surg 2016; 151: 846–53.

Serenari M, Han KH, Ravaioli F, et al. A nomogram based on liver stiffness predicts postoperative complications in patients with hepatocellular carcinoma. J Hepatol 2020; 73: 855–62.

Allaire M, Goumard C, Lim C, Le Cleach A, Wagner M, Scatton O. New frontiers in liver resection for hepatocellular carcinoma. JHEP Rep 2020; 2: 100134.

Marasco G, Alemanni LV, Colecchia A, et al. Prognostic value of the albumin-bilirubin grade for the prediction of post-hepatectomy liver failure: a systematic review and meta-analysis. J Clin Med 2021; 10: 2011.

CONFLICTS OF INTEREST

The authors declare no conflict of interest in relation to this work.

HOW TO CITE

Olivier Lieuga, Tatiana Jiengoue Tchakonang, and Augustine Nji Asakizi. (2026). The Assessment of Methods Used to diagnose Hepatocellular Carcinoma to the 396 decompensated cirrhotic patients at the Bertoua Regional Hospital. IQ Research Journal, 5(2), IQRJ-V05I02-26005017. www.iqresearchjournal.com

ANNEXES

Annex I — Table 1: Hepatocellular Carcinoma Patient Characteristics

Patient Characteristics	Cameroonians		Chadians		Nigerians		Centrafric Republic		Others Nationalities	
	n	%	n	%	n	%	n	%	n	%
Patient Characteristics	213	58,33	87	21,96	54	13,63	32	8,08	10	2,52
Age (Years Old)										
20 – 35	125	58,68	61	70,11	15	27,77	9	28,12	5	50
35 - 55	56	26,29	14	16,09	13	24,07	12	37,5	3	30
55 – Over	32	15,02	12	13,79	26	48,14	11	34,37	2	20

Annex II — Table 2 : Results of Exams/Tests done for the diagnostic of HCC

Imaging Tests	Multiphase CT Scan		Multiphase MRI		Arterial Phase Enhancement		Fibroscan		Liver Imaging Reporting and Data System	
	n	%	n	%	n	%	n	%	n	%
Patient	271	68,43	0	0	0	0	271	68,43	0	0

Annex III — Table 3 : Results of Exams/Tests done for the diagnostic of HCC

Liver Function Tests	Fibrotest – Actitest		GALAD Score		AFP Test	
	n	%	n	%	n	%
Patient	271	68,43	0	0	271	68,43