

Research Article

The Role of Imaging in the Diagnosis of Hepatobiliary Disorders in Niamey

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Abstract

Hepatobiliary diseases are conditions that originate in and affect the liver and/or the biliary tract. In Niger, very few studies have been conducted on this topic, which prompted us to undertake this study to evaluate the role of medical imaging in the diagnosis of hepatobiliary diseases. This was a descriptive study with prospective data collection, conducted from June 1, 2023, to May 31, 2025, at the Amirou Boubacar Diallo National Hospital in Niamey. It included all patients, regardless of age or sex, who underwent exploratory hepatobiliary imaging and were diagnosed with a liver and/or biliary tract disease. During this study, 118 lesions were identified in 84 patients, some of whom had multiple conditions. The patients had a mean age of 46 years and were predominantly female. Hepatic colic was the primary reason for consultation (30.95%), followed by jaundice and abdominal distension. Liver diseases were dominated by cirrhosis at 12.25%, followed by neoplastic causes, including primary liver carcinoma (7.63% of lesions), biliary cysts (5.93%), and liver metastases (5.08%). Regarding biliary abnormalities, gallbladder stones were the most common, accounting for 34.75% of lesions, followed by acute cholecystitis at 17.80%. This study shows that hepatobiliary diseases were numerous and presented with a wide range of symptoms. Ultrasound and hepatobiliary computed tomography were the most commonly used imaging modalities. Biliary pathologies were primarily dominated by gallstones and cholecystitis, while hepatic abnormalities were dominated by cirrhosis and hepatocellular carcinoma.

Keywords

Imaging, Pathology, Hepatobiliary, Niamey, Niger

1. Introduction

Hepatobiliary diseases are conditions that affect and develop at the expense of the liver and/or the bile ducts, leading to anatomical and functional changes in these organs. These

conditions are numerous and varied and constitute a significant public health problem.

The symptoms of hepatobiliary diseases vary widely, and not

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all signs are specific, which can complicate diagnosis. It is therefore appropriate that the diagnostic approach for these conditions relies on medical imaging studies. However, it is important to note the wide range of imaging techniques that can be used to evaluate the liver and bile ducts, not to mention the numerous advances in medical imaging observed over the past two decades.

Abdominal CT scanning is an essential test in the diagnosis of liver diseases [1]. The diagnostic approach must be systematic. The first step is therefore to determine the presence of hepatic parenchymal disease (hepatitis, cirrhosis, granulomatous processes and other infiltrative processes, expansive lesions), biliary disease (biliary obstruction, other causes of jaundice), vascular disease, or splenomegaly [2].

In Niger, very few studies exist on this subject, which prompted us to conduct this study, the objective of which was to evaluate the contribution of medical imaging to the diagnosis of hepatobiliary diseases.

2. Methodology

This was a descriptive study with prospective data collection, conducted over a 24-month period (June 1, 2023, to May 31, 2025) at the Amirou Boubacar Diallo National Hospital in Niamey. The study included all patients, regardless of age or sex, who underwent diagnostic hepatobiliary imaging and were diagnosed with a liver and/or biliary tract disease.

This study involved the analysis of epidemiological data (age, sex, comorbidities, and personal history), clinical data (signs and symptoms of hepatobiliary disease and associated conditions), laboratory data (transaminases, alkaline phosphatase, prothrombin level, bilirubin levels, blood glucose), and hepatobiliary imaging modalities.

To collect the data, an individual survey form was developed that included the various variables necessary for our study. The collected data were entered and analyzed using Microsoft software (Word, Excel 2024) and Sphinx Plus 2 V5. Pearson's chi-square test was used for statistical analysis, with a $p\text{-value} \leq 0.05$ considered statistically significant.

3. Results

During our study period, out of a total of 2,752 admissions,

we identified 84 patients with liver and/or biliary tract diseases, representing a hospital prevalence of 3.05%. A total of 118 lesions were found among the 84 patients, some of whom had multiple conditions.

Female patients were in the majority, with 51 cases, representing 60.71% of the patients, and a sex ratio of 1.54. The mean age of the patients was 46 years, with ages ranging from 12 to 84 years. Patients aged 60 years or older were the most numerous, accounting for 23.81% of cases, followed by the 30–39 and 40–49 age groups, which represented 20.24% and 19.05% of cases, respectively.

Hepatic colic, jaundice, and abdominal distension were the main reasons for seeking medical care, accounting for 30.95%, 20.24%, and 11.90% of patients, respectively. The most common comorbidity observed was viral hepatitis B, affecting 20.24% of patients, followed by obesity (13.09%) and diabetes (11.91%).

Laboratory abnormalities primarily consisted of elevated transaminases (ASAT, ALAT) in 42.86% of patients, hyperbilirubinemia in 28.57%, and a decreased prothrombin time (PT) in 13.1%. Elevated alpha-fetoprotein (AFP) levels were present in 19.04% of patients.

In terms of imaging, hepatobiliary ultrasound was the most valuable imaging modality for diagnosing hepatobiliary disorders, as it was performed on all of our patients. Computed tomography (CT) scans, meanwhile, were performed in 72% of patients. There were 53 cases of liver disease, accounting for 44.92% of all lesions, divided into two subgroups: neoplastic and non-neoplastic. Among neoplastic causes, primary liver carcinoma (PLC) was the most common, accounting for 7.63% of lesions, followed by biliary cysts and liver metastases, at 5.93% and 5.08%, respectively. As for non-neoplastic causes, liver cirrhosis was the most frequent, accounting for 15.25% of lesions.

Regarding biliary abnormalities, there were 65 cases, representing 55.08% of all hepatobiliary pathologies. Gallstones were the most common, accounting for 34.75% of lesions, followed by acute cholecystitis at 17.80%.

The bivariate analysis revealed a statistically significant association between hepatobiliary lesions and, on the one hand, gender ($P = 0.023$) and, on the other hand, the presence of comorbidities ($P = 0.001$).

Table 1. Breakdown of Patients by Reason for Visit.

Motif de consultation	Number (N)	Percentage (%)
Jaundice	17	20,24
Hepatic colic	26	30,95
Abdominal distension	10	11,90
Masse in the right upper quadrant	3	3,57
Diffuse abdominal pain	8	8,52

Motif de consultation	Number (N)	Percentage (%)
Weight loss	5	5,95

Table 2. Breakdown by comorbidities and personal history.

Comorbidités et antécédents personnels	Number (N)	Percentage (%)
HBV	17	20,24
HCV	2	2,38
Diabetes	10	11,90
Obesity	11	13,09
Alcohol	3	3,57
Sickle cell anaemia	8	9,52
Cholecystectomy	2	2,38

Table 3. Breakdown of patients by type of hepatobiliary condition.

Pathologies hépato-biliaires	Nombre (N)	Percentage (%)
Cirrhosis	18	15,25
Liver metastases	6	5,08
Hepatocellular carcinoma	9	7,63
Gallbladder tumour	2	1,69
Gallstones	40	33,90
Acute cholecystitis	21	17,80
Angiocholitis	1	0,85
Fatty liver	8	6,78
Biliary cyst	7	5,93
Liver abscess	1	0,85
Liver necrosis	1	0,85
Haemangioma	4	3,39
Total	118	100

4. Discussion

Our hospital prevalence rate was 3.05%. This rate is significantly lower than that reported by Ngami [1] in Gabon, which was 13.29%.

The low prevalence in our study could be explained by the socioeconomic status of our underdeveloped country and the

low income of the population, which discourages people from seeking hospital care or leads them to seek care at a late stage. Medical imaging plays a vital role in the diagnosis of hepatobiliary diseases. Ultrasound is far more widely available and accessible in our setting than computed tomography (CT) or magnetic resonance imaging (MRI). It is as useful as computed tomography (CT) for detecting gallstones, dilation of the bile ducts, thickening of the gallbladder wall, intra- and

peri-hepatic masses, periportal fibrosis, hepatosplenomegaly, and signs of portal hypertension. Ultrasound can distinguish solid lesions from abscesses and cysts and detect certain helminths in the hepatobiliary tract [2].

In our study, there was a predominance of female patients, accounting for 60.71% of the cohort, with a mean age of 46 years. Our data were similar to those reported by Agoda et al. [3] in Togo, who also observed a female predominance of 60% and a mean age of 42 years. Biliary abnormalities, which were much more common than hepatic pathologies, were dominated by uncomplicated gallbladder stones, accounting for 33.90% of lesions, followed by acute cholecystitis at 17.80%. Gallstones are asymptomatic in the majority of cases and are discovered incidentally during an abdominal ultrasound performed for another reason. The mere presence of gallstones generally does not cause symptoms, and most patients will remain asymptomatic throughout their lives. However, in approximately 20% of patients, the condition becomes symptomatic, with an estimated annual risk of between 1% and 4% of developing clinical manifestations [4].

Liver diseases were largely dominated by cirrhosis, accounting for 15.25% of all lesions, followed by hepatocellular carcinoma and hepatic steatosis, at 7.63% and 6.78%, respectively. Hepatocellular carcinoma (HCC) is a condition that is increasingly affecting younger individuals in developing countries, and its etiology is primarily attributed to the hepatitis B virus (HBV), the hepatitis C virus (HCV), heavy alcohol consumption, and nonalcoholic fatty liver disease (NAFLD) [5, 6].

This predominance of cirrhosis and hepatocellular carcinoma may be explained by the presence of the hepatitis B virus in one-fifth of our patients, as well as by the high prevalence (13.8%) of the hepatitis B virus in the general population of Niger [7, 8] and low vaccination coverage. This predominance of hepatitis B as the etiology is consistent with data from the African literature [6, 9, 10].

5. Conclusion

This study shows that hepatobiliary diseases are numerous and present with a wide variety of symptoms. Ultrasound and hepatobiliary computed tomography were the most commonly used imaging modalities. Biliary disorders were primarily dominated by gallstones and cholecystitis, while hepatic abnormalities were dominated by cirrhosis and hepatocellular carcinoma.

Abbreviations

AFP	Alpha-fetoprotein
ALAT	Alanine Aminotransferase
ASAT	Aspartate Aminotransferase
HNABD	Amirou Boubacar Diallo National Hospital
PT	Prothrombin Time

UAM	Abdou Moumouni University
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus

Authors Contributions

Guidah Seidou: Methodology, Supervision, Validation

Mahamat Hissene Tidjani: Methodology, Validation

Djahi Christ Claver: Ressources

Younssa Hama: Supervision

Alhou Salifou: Supervision

Ali Ousseini: Supervision

Conflict of Interest

The authors declare no conflicts of interest.

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