

# The histopathological pattern of liver biopsies at the University of Benin Teaching Hospital

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## Abstract

**Objective:** Microscopic examination of liver tissues remains an essential part in the diagnostic work-up of patients with liver diseases. The aim of this study is to determine the histopathological pattern of liver diseases at the University of Benin Teaching Hospital, Benin City, Nigeria.

**Materials and Methods:** This is a retrospective study of all cases of liver biopsies between January 2005 and December 2011. The appropriate data was obtained from the Surgical day book of the department of histopathology. The data was analyzed to reflect age, sex, and pathological diagnosis of the lesions.

**Results:** A total of 80 cases of liver biopsies were reported during the 7-year period. There were 50 males and 30 females with a male:female ratio of 1.7:1. The age ranged from 4 months to 69 years with a mean age of  $38.4 \pm 13.3$  years. The highest incidence was in the 4<sup>th</sup> decade. The three common histopathological diagnoses were inflammatory lesions, 63.8%; malignant neoplasms, 22.5%, and liver cirrhosis in 6.3% of cases. Other less common lesions were alcoholic liver disease and steatosis. This peak age incidence of chronic hepatitis precedes that of hepatocellular carcinoma by about two decades.

**Conclusion:** The preponderance of chronic hepatitis, hepatocellular carcinoma, and liver cirrhosis in this study is similar to those already established in the African literature, with hepatitis B and/or C being the most incriminated risk factors due to their endemicity in our environment. Public enlightenment programs, widespread implementation of hepatitis B virus vaccination, and surveillance of individual at-risk are essential for the control of hepatitis infection and its late complications.

**Key words:** Chronic hepatitis, cirrhosis, hepatocellular carcinoma, liver biopsy

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## Introduction

The liver is one of the organs in the body that is most vulnerable to a wide variety of metabolic, toxic, microbial, circulatory, and neoplastic insults. The major diseases of the liver include: Viral hepatitis, alcoholic liver disease, nonalcoholic fatty liver disease (NAFLD), and hepatocellular carcinoma.<sup>[1,2]</sup> Reports from previous studies have shown that infective agents, particularly viruses, account for the bulk of liver disorders in sub-Saharan Africa.<sup>[3,4]</sup>

Most liver diseases begin as an insidious process in which clinical detection and presentation may occur weeks,

months, or many years after the onset of injury; thus, patients with hepatic abnormalities who are referred to the hepatologists most frequently have chronic liver disease. High frequencies of chronic hepatitis, liver cirrhosis, and hepatocellular carcinoma (HCC) have been reported in most studies from Nigeria and Africa as well as other parts of the world.<sup>[5-8]</sup>

In Nigeria as in other countries in sub-Saharan Africa, the major cause of chronic hepatitis is the hepatotropic group of

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viruses: Hepatitis B virus (HBV), hepatitis C virus (HCV) and hepatitis D virus (when it co-exists with HBV).<sup>[9]</sup> Liver cirrhosis and HCC have also been found to be prevalent in hepatitis B and/or C endemic areas where they develop sequel to the chronic hepatitis associated with these viruses.<sup>[2,8,10,11]</sup>

The role of alcohol in the development of chronic liver disease in our environment is thought to be low;<sup>[12]</sup> however, the synergistic effect of alcohol and hepatitis B and/or C infection in the development and progress of chronic liver disease to cirrhosis and HCC is well established.<sup>[12-14]</sup>

The aim of this present study is to determine the pattern of histological diagnoses made from liver biopsies in the University of Benin Teaching Hospital.

## Materials and Methods

All liver biopsies received at the Department of Pathology, University of Benin Teaching Hospital, Benin City, Nigeria, from January 2005 to December 2011 were reviewed and formed the basis for this study.

University of Benin Teaching Hospital, Benin City, Edo State, is located in the South-South region of Nigeria and caters for the health needs of patients in this geo-political zone with a population of over 10 million people. Clinical and demographic data regarding age, sex, and clinical information were obtained from request cards and the Surgical day books of the department. Slides were retrieved from the archives of the department and when necessary, new slides were made from formalin fixed, paraffin-embedded blocks, and used for the histological diagnosis.

Statistical analysis was done using the SPSS version 16 statistical package.

## Results

During the 7-year period, there were 80 cases of reported liver biopsies at the University of Benin Teaching Hospital. There were 50 males and 30 females with a male:female ratio of 1.7:1. The age ranged from 4 months to 69 years with a mean age of  $38.4 \pm 13.3$ . The highest incidence was in the 4<sup>th</sup> decade, as shown in Table 1.

The three common histopathological diagnoses were inflammatory lesions, 63.8%; malignant neoplasms, 22.5%, and liver cirrhosis in 6.3% of cases. Other less common lesions were alcoholic liver disease and steatosis as shown in Table 2.

Inflammatory lesions of the liver accounted for 63.8% of cases with a peak age of incidence in the 30-39 year age group. Of these cases, 55% (28/51) and 43% (22/51) were due to chronic active hepatitis and chronic persistent

hepatitis, respectively, of the old classification. Only a single case of neonatal hepatitis was seen and it occurred in a 4-month-old male patient.

HCC was the most common malignant neoplasm seen accounting for 55.6% (10/18) of cancer cases. Half of the cases occurred between 30 and 59 years with a peak age group of 50-59 years and a male:female ratio of 4:1. One case each of cholangiocarcinoma and hepatoblastoma were seen. The remaining six cases were metastatic liver malignancies; four of which were adenocarcinoma from the gastrointestinal tract, a case each of renal cell carcinoma and adenoid cystic carcinoma from the breast.

Liver cirrhosis was the third most common lesion accounting for 6.3% of the cases. The male:female ratio was 4:1 with a peak age of incidence in the 30-39 year age group. Though the primary cause of the disease could not be ascertained

**Table 1: Age and sex distribution of cases**

Age group	Sex		Total (%)
	Male	Female	
0-9	2	0	2 (2.5)
10-19	1	0	1 (1.3)
20-29	9	6	15 (18.8)
30-39	20	6	26 (32.5)
40-49	8	11	19 (23.8)
50-59	8	3	11 (13.8)
60-69	2	4	6 (7.5)
Total (%)	50 (62.5)	30 (37.5)	80 (100)

**Table 2: Sex distribution of liver diseases**

Diagnosis	Sex		Total (%)
	Male	Female	
Chronic hepatitis	31	19	50 (62.5)
Neonatal hepatitis	1	0	1 (1.3)
Hepatocellular carcinoma	8	2	10 (12.5)
Hepatoblastoma	1	0	1 (1.3)
Cholangiocarcinoma	0	1	1 (1.3)
Metastatic tumor	2	4	6 (7.5)
Cirrhosis	4	1	5 (6.3)
Alcoholic liver disease	3	1	4 (5)
Steatosis	0	2	2 (2.5)
Total (%)	50 (62.5)	30 (37.5)	80 (100)

**Table 3: Comparative study of common liver diseases**

Liver diseases	Study Center			
	UBTH (Benin) (%)	JUTH (Jos) (%)	Ile-Ife (%)	LUTH (Lagos) (%)
Inflammatory lesions	63.8	37.5	37.2	26.4
Tumors	22.5	-	15.8	39.7
Cirrhosis	6.3	25	41.4	17.7

UBTH=University of Benin Teaching Hospital, JUTH=Jos University Teaching Hospital, LUTH=Lagos University Teaching Hospital

on biopsy, a majority of cases showed evidence of on-going chronic hepatitis.

Table 3 shows a comparative study of the major liver diseases (inflammatory lesions, tumors, and liver cirrhosis) in some centers in Nigeria.

## Discussion

The incidence as well as pattern of liver diseases varies from one region to another as do the various etiological agents or factors. The three most common liver diseases seen in this study are inflammatory diseases, tumors, and cirrhosis with frequencies of 63.8%, 22.5%, and 6.3%, respectively. The age and sex distribution agree with previous findings from Nigeria.<sup>[2,5,15,16]</sup>

Inflammatory lesion of the liver was the most common form of liver disease, accounting for 63.8% of liver biopsies studied. This agrees with a previous study in Jos, Nigeria, where inflammatory lesion of the liver was the most common liver disease in their study population, however it was due to parasitic infestation.<sup>[17]</sup> Reports from Lagos and Ife have previously shown a prevalence of 26.4% and 37.2%, respectively, of inflammatory liver disease.<sup>[2,12]</sup> Most of the cases of inflammatory lesion encountered were chronic hepatitis with a single case of neonatal hepatitis. In 43% (22/51) of cases, there was sufficient morphological evidence to suggest HBV as the culprit, while the primary etiological agent was not discernible in others. However, chronic hepatitis B and/or C virus infections are still the predominant causes of chronic hepatitis in our environment. Although hepatitis B viral markers were not done in this study, previous Nigerian studies have indicated the incidence of HBsAg to be in the range of 50-60%.<sup>[11,18,19]</sup> Persons at risk of HBV infection can be protected by vaccination with hepatitis B vaccine, which has been shown to be safe and has the ability to induce antibodies to HBsAg in nearly 95% of healthy recipients.<sup>[20]</sup>

Tumors of the liver constituted 22.5% of liver diseases in this study. HCC was the most common malignancy encountered accounting for 55.6% (10/18) of liver tumors; this was followed by metastatic tumors which was seen in 33.3% (6/18) of cases. This finding is similar to a previous study in Ilorin, Nigeria, where HCC and metastatic tumors accounted for 64% and 24.7%, respectively, in their study population.<sup>[16]</sup> Various workers have highlighted the high incidence of HCC in their study groups.<sup>[2,5,19]</sup> Fifty percent of HCC occurred between the 4<sup>th</sup> and 6<sup>th</sup> decade with a peak age in the 50-59 year age group, similar to previous report from Lagos and Ilorin Nigeria.<sup>[2,16]</sup> This peak age is about two decades later than that of chronic hepatitis confirming most previous reports and suggesting a possible existence of a continuum between these diseases.

HCC is one of the most common and devastating malignant tumors worldwide with variable geographic incidence due to differences in the major risk factors.<sup>[12,21,22]</sup> Most cases of HCC occur in Asia and sub-Saharan Africa. In Africa, the highest incidence has been documented among the Bantu males in Mozambique.<sup>[23]</sup> In Nigeria, the prevalence of HCC increases as one migrates from the Southern Rainforest to the Northern Savanna.<sup>[24,25]</sup> It is usually a complication of chronic liver disease that is mainly caused by hepatitis B and/or C viral infections. Other important etiological risk factors are aflatoxin B1, alcohol, and cigarette smoking. HCC is mostly associated with alcoholic liver disease in Northern Europe and the USA.<sup>[21]</sup>

Metastatic tumor of the liver was the second most common cancer encountered, accounting for 33.3% (6/18) of liver tumors. This is similar to previous report from Lagos and Ilorin, Nigeria.<sup>[2,16]</sup> However, in Caucasians the overwhelming majority of liver cancers are metastatic; these are mostly from the breast, lung, and colon.<sup>[26]</sup> Similar to previous reports, cholangiocarcinoma and hepatoblastoma were rare in this study as a single case each was identified.<sup>[2,16]</sup> Cholangiocarcinoma is usually associated with cholelithiasis and/or congenital biliary cysts and trematode infection which is endemic in several Asian populations.<sup>[27]</sup>

Liver cirrhosis occurred in 6.3% of the liver biopsies studied with similar age and sex distribution to previous reports in most African literature.<sup>[2,9,19]</sup> Liver cirrhosis is a common end-stage liver disease characterized by chronic progressive fibrosis irrespective of the etiology. Chronic viral hepatitis remains the most important etiological factor in our environment as well as other parts of Africa and most parts of Asia, while other causes include: Hemochromatosis and alcoholic liver disease.<sup>[9,12]</sup> A lot of study is going on about the progression and fibrogenesis of the disease, and this knowledge is being employed in drug therapy to reverse this process in chronic liver disease.<sup>[8]</sup> In this regard, early presentation and prompt diagnosis are necessary to halt the possible conversion/progression to HCC.

Similar to most African studies, alcoholic liver disease was not a very common finding in our study population as it occurred in 5% of cases.<sup>[2,9,12]</sup> The converse is true in the Caucasians, where chronic alcoholism is generally considered to be a major risk factor in the development of chronic liver disease.<sup>[2,12,28]</sup> Many studies have demonstrated an appreciable increase in the proportion of chronic liver disease with increasing consumption of alcohol in hepatitis B and/or C endemic areas.

## Conclusion

In conclusion, this study has shown that the common liver diseases in the University of Benin Teaching Hospital are:

Chronic hepatitis, HCC, and liver cirrhosis, with alcoholic liver disease as a rare finding. The trend of the diseases among the age groups points to a common etiology for the three common liver disorders, with hepatitis B and/or C being the most incriminated due to their endemicity in our environment. This preliminary data would provide a baseline for future research and help in formulating management policies for patients with chronic liver diseases in our environment. Vaccination against HBV and treatment of chronic hepatitis B and/or C infection is therefore highly recommended in the sub-Saharan Africa as a primordial prevention for the development of chronic liver disease. It is hoped that proper implementation of HBV vaccination in the National program of immunization and in high risk individuals will significantly reduce if not totally eliminate viral hepatitis-associated chronic liver diseases.

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