

Hepatocellular carcinoma in Jos, Nigeria

*Echejoh G O, FMCPPath; *Tanko M N FMCPPath; *Manasseh A N FMCPPath, ***Ogala-Echejoh S MBBS,
**Ugoya S O FMCP, *Mandong B M FMCPPath*,

*Department of Pathology, Jos University Teaching Hospital **Department of Medicine, Jos University Teaching Hospital. ***Department of Medicine, Plateau state Specialist Hospital Jos.

Abstract

Background: Hepatocellular carcinoma (HCC) is the most common abdominal malignancy, representing 80-90% of primary liver malignancies around the world. There is a disturbing trend of increased incidence of HCC around the world. We therefore, determined the trend of HCC in Jos.

Methods: A ten-year retrospective review was done of all cases of HCC which diagnoses were histologically confirmed as recorded in the Cancer Registry of Jos University Teaching Hospital. The patients' clinical case notes (including surgical and radiological findings) were also reviewed.

Results: A total of 71 cases of HCC (31.3% of 227 liver biopsies in the same period) were diagnosed within the 10-year period. There were 46 males and 25 females with a male/female ratio of 1.8:1. The age range of the patients was 23 years to 75 years, with a mean age of 45.4±13.1 years. Seventy two percent (72%) of them were between ages 21 years and 50 years. Only 28% were between 51 years and 80 years. The highest rate of 12(17.1%) was seen in the year 2004.

Conclusion: The study showed that there was a high prevalence of HCC in Jos, and that HCC was more prevalent in the younger age group compared to what obtains in developed nations.

Keywords: Liver, Hepatocellular carcinoma, age, sex, trend.

Date accepted for publication: 11th March 2008

Nig J Med 2008; 211 - 214

Copyright ©2008 Nigerian Journal of Medicine

Introduction

Hepatocellular carcinoma (HCC) is the most common abdominal malignancy, representing 80-90% of primary liver malignancies worldwide.¹⁻³ It's incidence peaks between the ages 50-70years, and it is more common in men, with male to female ratio of 4:1.^{1,4} There is a disturbing trend of increased incidence of HCC around the world.^{3,5} The incidence varies greatly with geographic location, ethnic background and sex.³ For instance, incidence rates among men in Sub-Saharan Africa and Asia may be 20 times higher than those among men in the

United States.⁶ The higher incidence of HCC in Asia and Africa is said to be probably related to hyper-endemic rates of viral hepatitis and environmental carcinogens (e.g. Aflatoxins).⁴ The risk factors for HCC include cirrhosis, chronic hepatitis, carcinogens and errors in metabolism.

However, there is hardly any base line documentation of the prevalence of HCC in our centre, Jos, North Central Nigeria. We therefore determined the prevalence of HCC in a retrospective study of diagnosed HCC between 1995 and 2004 in Jos University Teaching Hospital (JUTH), Jos

Materials/ methods**Study Area**

Jos University Teaching Hospital (JUTH) has over 500 beds with 20 wards in addition to intensive care unit (ICU) and special care baby unit (SCBU). It has a well functioning histopathology laboratory that receives and processes about 2000 tissue samples and 1000 cytology specimens annually. It receives specimens from the North Central region of Nigeria comprising of 6 states with a population of over 20 million people.

Method

We retrospectively reviewed the records of all cases of diagnosed HCC in the Cancer Registry of JUTH over the past 10 years (1995-2004). We retrieved archival slides and reviewed them, and where diagnosis was not clear we made fresh sections (3-5i) from the archival paraffin embedded tissues and stained with haematoxylin and eosin, periodic acid Schiff (PAS), Perl's and Masson trichrome. The slides were then read by the pathologists (authors). We equally reviewed the clinical case notes (including surgical and radiological findings) of the patients.

Statistical Analysis

The data were analysed using Epi-info 2000; version 3.2.2 computer soft ware programme. Chi-square test was employed for the test of significance. A value of $p < 0.05$ was considered significant.

Results

A total of 71 cases of hepatocellular carcinoma (31.3% of 227 liver biopsies in the same period) were diagnosed in the histopathology department of JUTH over a period of 10 years (1995-2004). The frequency per year is shown in figure 1. Initially the prevalence was high, became low and stable for 3 years, but lately was seen to be increasing steadily except in 2003 where it dropped drastically. There were 46 males and 25 females with male/female ratio of 2:1. The age of the patients ranged from 23 years to 75 years, with a mean age of 45.4±13.1 years. Fig 2 shows the age distribution of the patients with the highest number of patients 21(29.6%) observed within 41 years to 50 years age group; and the least number of patients 2(2.8%) observed within 71 years to 80 years age group. Seventy two percent of HCC were between ages 21 years and 50 years, ($\chi^2=287.9, p<0.001$). Histological and gross/radiological features showed that 50(70.4%) HCC were diffuse and infiltrative while 21(29.6%) were nodular (fig 3). Table 1 shows the age distribution of those with nodular pattern and those with infiltrative growth pattern. There was however, a clustering of both patterns around the younger age groups. Figures 4 and 5 show photomicrographs of HCC with acinar and diffuse (infiltrative) patterns respectively.

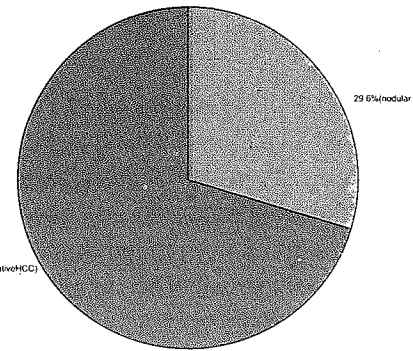


Fig. 3: Distribution of HCC into nodular and infiltrative pattern.

Table I: Distribution of nodular and infiltrative HCC by age group.

Age group	HCC	
	Nodular	Infiltrative
21-30	3	8
31-40	5	14
41-50	6	15
51-60	3	7
61-70	3	5
71-80	0	2

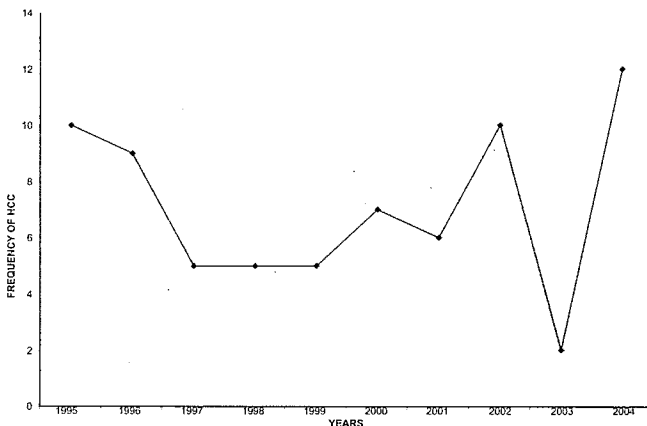


Fig 1: Frequency of HCC per year

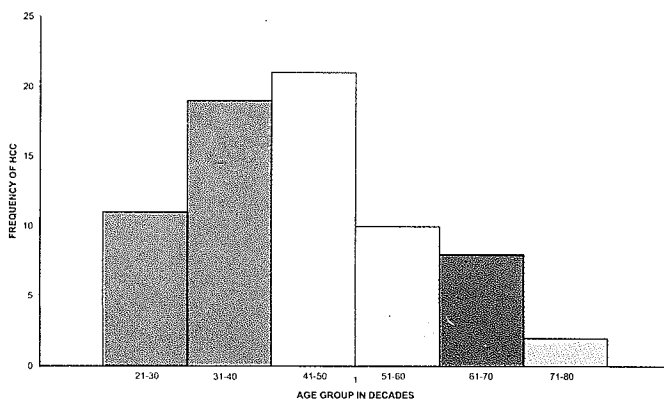


Fig. 2: Distribution of HCC by age group



Figure 4: HCC with clear cell/acinar pattern. H&E stain (X20 objective)

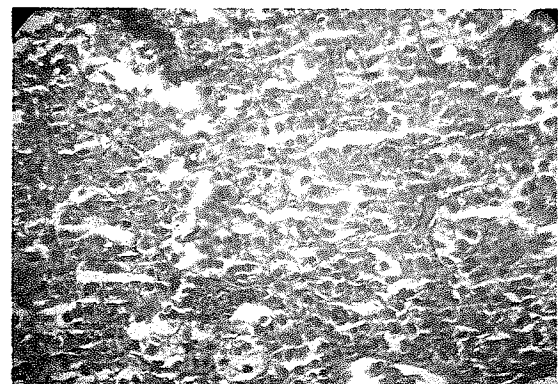


Figure 5: HCC with diffuse infiltrative pattern. H&E stain (X20 objective)

Discussion

Within the period of 10 years, a total of 71(31.3%) cases of Hepatocellular carcinoma (HCC) were diagnosed in the histopathology laboratory of Jos University Teaching Hospital. Osuafor et al recorded 38 cases in 6 years in Enugu, Eastern Nigeria.⁷ We found that there was initial high prevalence within the first two years, 1995 and 1996 after which we noticed a gradual decline. In this environment especially Plateau state, like the Bantu tribes of South Africa, there is the consumption of locally brewed, very high percentage alcoholic beverage with the attendant increased intake of iron due to the use of metallic drums. This could lead to haemochromatosis, a predisposing factor to HCC. This was a common practice in the past, but the awareness of its association with chronic liver disease and HCC has led to a decline in the practice. This might explain the initial high prevalence of HCC observed in this study. Late presentation and the ease of diagnosis using non-invasive diagnostic techniques might account for the reduction in the number of HCC diagnosed by liver biopsy. However, since the year 2000, we found a steady increase in the prevalence of HCC up to the year 2004 except for a drastic fall in 2003. This increased incidence was also noticed in several studies in the USA, United Kingdom^{3,5,8,9} and France.^{10,11}

Although there may be detection bias, the reason for this increasing trend of incidence of HCC is not clear. A possible explanation may be the wide spread transmission of viral hepatitis through intravenous drug abuse and unscreened blood product transfusions in the 1960s.⁹ A study has shown that through aggressive hepatitis B vaccination, HCC incidence rates in Taiwanese children declined significantly during the first 10 years of the programme.¹²

Of all the cases of HCC recorded in this study, no single record of serological test for any of the hepatotropic viruses was seen. This may have been due to the fact that relevant serological tests were not common practice within the period covered by this study, and probably due to inadequate facilities for the tests; or poor record keeping.

The patients comprised of 46 males and 25 females with a male/female ratio of approximately 2:1. This is in agreement with the general belief that HCC has male preponderance.¹ However, Flickinger et al had a higher ratio of (m/f; 4:1) in their study.⁴ The same sex ratio (4:1) was found by Duvoux who said that one of the risk factors for HCC in cirrhotics is male gender.²

The age range of the patients was 23 years to 75 years, with the mean age of 49.6 ± 13.1 years. In this study we discovered that 72% of the cases of HCC were between 21 years and 50 years. This is in sharp contrast to most findings that the peak incidence of HCC is above age 50 years.^{1,4} In Vienna Austria, Schoniger-Hekele and co-workers recorded a median age at detection of HCC of 63.3 years.⁵

Twenty one cases of HCC (29.6%) were observed to be nodular on background cirrhosis while 50 cases (70.4%) had diffuse and infiltrative features. Benvegno et al in Italy discovered that nodular HCC was associated with older age; and unrelated to the aetiology of underlying chronic liver disease, while development of an infiltrating and aggressive type of HCC was strongly related to ongoing HBV infection or HBV and HCV co-infection.¹³ However, in this study it was observed that both nodular and infiltrative HCC had 86% of them clustering within the ages 21 years to 60 years. It is believed that areas with high prevalence of HBsAg carriage have high incidence of HCC in the younger age group; and have more of the diffuse, infiltrating type of HCC indicating accelerated hepatocarcinogenesis in HBsAg carriers.¹⁴⁻¹⁹ Though in this study there were no documented serological test for the hepatitis viruses, it is well known that this region and Asia have high prevalence of viral hepatitis and other environmental carcinogens accounting for the high prevalence of HCC in the younger age group.⁴

Conclusion

In this study, we found that the level of HCC in Jos, North Central Nigeria was significantly high; and that HCC was more prevalent in the younger age groups in contrast to what obtains in developed countries. There is also the need for complete epidemiologic data banking at the time of patient management for future Clinico-pathologic studies.

References

1. MacKenzie JD, Millstine J, Rivera MN, Ros PR. Hepatocellular Carcinoma. Brigham Rad; Professional Education. April 22, 2002.
2. Duvoux C. Epidemiology and diagnosis of hepatocellular carcinoma in cirrhosis. *Ann Chir* 1998; 52: 511-517.
3. Ulmer SC. Hepatocellular carcinoma: A concise guide to its status and management. *Postgraduate Medicine* 2000; 107: 117-124.
4. Flickinger JC, Carr BI, Lotze MT. Cancer of the liver. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: principles and practice of oncology*. 5th ed. Philadelphia: Lippincott-Raven, 1997: 1087-1097.
5. Schoniger-Hekele M, Muller C, Oesterreicher C, Ferenci P, Gangl A. Hepatocellular carcinoma in Austria: aetiological and clinical characteristics at presentation. *Eur J Gastroenterol Hepatol*. 2000; 12: 941-948.
6. Sherlock S. Hepatic tumours. In: *Diseases of the liver and biliary system*. 8th ed. London: Blackwell Scientific, 1989: 585.
7. Osuafor TO, Ikerionwu SE, Ukabam SO. Liver biopsy: experience at Enugu, eastern Nigeria. *Scand J Gastroenterol Suppl*. 1986; 124: 107-112.
8. Landis SH, Murray T, Bolden S, et al. cancer statistics, 1998. *CA Cancer J Clin* 1998; 48: 6-29.
9. El-Serag HB, Mason AC. Rising incidence of hepatocellular carcinoma in the United States. *N Engl J Med* 1999; 340: 745-750.
10. Taylor-Robinson SD, Foster GR, Arora S, et al. Increase in primary liver cancer in the UK, 1979-94. (Letter) *Lancet* 1997; 350: 1142-1143.
11. Deuffic S, Poynard T, Buffat L, et al. trends in primary liver cancer. (Letter) *Lancet* 1998; 351: 214-215.
12. Chang MH, Chen CJ, Lai MS, et al. for the Taiwan Childhood Hepatoma Study Group. Universal hepatitis B vaccination in Taiwan and the incidence of hepatocellular carcinoma in children. *N Engl J Med* 1997; 336: 1855-1859.
13. Benvegna L, Noventa F, Bernardinello E, Pontisso P, Gatta A, Alberti A. Evidence for an association between the aetiology of cirrhosis and pattern of hepatocellular carcinoma development. *Gut* 2001; 48: 110-115.
14. Prince AM, Szmuness W, Michon J, et al. A case-control study of the association between primary liver cancer and hepatitis B infection in Senegal. *Int J Cancer* 1975; 16: 376-383.
15. Szmuness W. Hepatocellular carcinoma and the hepatitis B virus: evidence for a casual association. *Prog Med Virol* 1978; 24: 40-69
16. Kew MC, Desmyter J, Bradburne AF, et al. Hepatitis B virus infection in southern African blacks with hepatocellular cancer. *J Natl Cancer Inst* 1979; 62: 517-520
17. Beasley R, Lin C, Hwang LY, et al. Hepatocellular carcinoma and hepatitis B virus. A prospective study of 32707 men in Taiwan. *Lancet* 1981; II: 1129-1133.
18. Munoz N, Bosch X. Epidemiology of hepatocellular carcinoma. In: Okuda K, Ishak KG, eds. *Neoplasms of the liver*. Tokyo: Springer-Verlag, 1987; 3-19
19. Trevisani F, Caraceni P, Bernardi M, et al. Gross pathologic types of hepatocellular carcinoma in Italian patients. Relationship with demographic, environmental, and clinical factors. *Cancer* 1993; 72: 1557-1563