Hepatitis C virus-induced hepatocellular carcinoma in sub-Saharan Africa

Le carcinome hépatocellulaire induit par le virus de l’hépatite C en Afrique subsaharienne

M.C. Kew

Received: 4 March 2013; Accepted: 27 May 2013
© Springer-Verlag France 2013

Abstract In sub-Saharan Africa, as in other geographical regions, the incidence and, to a lesser extent, the characteristics of hepatitis C virus (HCV)-induced hepatocellular carcinoma differ from those of the tumor caused by hepatitis B virus. HCV is a less common and less well-documented cause of hepatocellular carcinoma in the African sub-continent than it is in resource-rich regions. Perhaps surprisingly, sub-Saharan Black Africans have the highest estimated regional prevalence of chronic HCV infection globally. The infection is more common in urban than in rural dwellers. Little information is available on the age at which HCV infection is acquired in sub-Saharan Black Africans, but the incidence of chronic infection is age-related, being highest (12%) in those over the age of 40 years. No significant difference in sex distribution is evident. The documented incidence of chronic HCV infection in Black patients with hepatocellular carcinoma in the sub-continent ranges from 1.7% in the Central African Republic to 40.3% in Somalia, but varies between 10 and 20% in the majority of the countries. Patients with hepatocellular carcinoma are, on average, 20 years older than those with hepatitis B virus-induced tumors. The sex difference between the patients just fails to reach statistical significance. As with hepatocellular carcinoma in other populations, much remains to be learnt about the mechanisms involved in the pathogenesis of HCV-induced hepatocellular carcinoma in sub-Saharan Black Africans.

Keywords Hepatocellular carcinoma · Sub-Saharan Africa · Black Africans · Hepatitis B virus · Hepatitis C virus · Chronic infection · Hepatitis/hepatitis C virus co-infection · Pathogenetic mechanisms

Résumé En Afrique subsaharienne comme dans d’autres régions, la fréquence et, dans une moindre mesure, les caractéristiques du carcinome hépatocellulaire (CHC) induit par le virus de l’hépatite C (VHC) diffèrent de celles des tumeurs induites par le VHB. Le virus de l’hépatite C (VHC) est une cause moins courante et moins avérée du CHC dans le sous-continent africain que dans les régions riches. De manière assez surprenante peut-être, les infections chroniques par le VHC au niveau mondial possèdent, selon les estimations, la plus grande prévalence au sein des populations noires de l’Afrique subsaharienne. L’infection est plus répandue chez les citadins que chez les habitants de la campagne. Il existe peu d’informations quant à l’âge auquel les populations noires d’Afrique subsaharienne sont infectées par le VHC, mais la fréquence des infections chroniques est liée à l’âge, le taux d’individus infectés étant le plus élevé (12 %) chez les plus de 40 ans. Il ne semble pas exister de différence significative en fonction du sexe des individus. La fréquence attestée des infections chroniques par le VHC parmi les patients noirs subsahariens atteints de CHC varie de 1,7 % en République centrafricaine à 40,3 % en Somalie, mais ce taux varie de 10 à 20 % dans la majorité des pays. Les patients atteints d’un CHC ont en moyenne 20 ans de plus que ceux atteints de tumeurs induites par le VHB. Les différences liées au sexe des patients ne possèdent pas de valeur statistique suffisante. À l’instar d’autres populations touchées par le CHC, il reste encore beaucoup à apprendre des mécanismes impliqués dans la pathogénie du CHC induit par le VHC parmi les populations noires subsahariennes.

Mots clés Carcinome hépatocellulaire · Afrique subsaharienne · Population noire d’Afrique · Virus de l’hépatite B · Virus de l’hépatite C · Infection chronique · Hépatite/co-infection par le virus de l’hépatite C · Mécanismes pathogéniques
Introduction

Epidemiological studies have shown the occurrence of hepatitis B and C viruses and the hepatocellular carcinoma (HCC) they cause to vary considerably in incidence and, to a lesser extent, in characteristics between geographical regions and populations. Chronic hepatitis B virus (HBV) infection is endemic, or even hyperendemic, in the Black population of the African sub-continent [1]. The infection is almost invariably acquired in early childhood, and is the dominant cause of the HCC that occurs with high frequency and at a relatively young age in this population [1]. Rural dwellers are infected with the virus far more often than are urban dwellers, and, accordingly, they have a significantly higher incidence of the tumor [1]. Chronic HBV infection is also more common in males than females, accounting, in part, for the higher occurrence rate of the tumor in the former. The infection may occur in parallel with dietary exposure to the fungal carcinogen, aflatoxin B1, and the two carcinogens then act synergistically in causing most of the high incidence of HCC in rural Black African dwellers [2]. Chronic HBV infection and HCC induced by the virus are rare in the relatively small Caucasian population of sub-Saharan Africa [3].

In contrast, chronic HCV infection occurs far less often than chronic HBV infection in sub-Saharan Black Africans. The infection is typically acquired in adulthood and is relatively more common in women than in men [4,5].

Urban Black Africans have a higher incidence of both chronic HCV infection and the resulting HCC than do their rural counterparts. Unlike the experience in the resource-rich countries in which HCV-induced HCC was first documented [6,7] and in which chronic HCV infection is the major cause of the tumor, the virus is a less well-documented cause of HCC in the resource-poor African sub-continent [4,5,8,9].

HCV infection is uncommon in the Caucasian population of sub-Saharan Africa [10].

Current knowledge of the occurrence of HCV infection and its role in causing HCC in sub-Saharan Black Africans are reviewed.

Incidence of hepatitis C virus infection in sub-Saharan Africa

Sub-Saharan Black Africans, perhaps surprisingly in view of their relatively low incidence of hepatitis C virus (HCV)-induced HCC, have the highest estimated regional prevalence of HCV infection globally [11]. In an extensive analysis of the literature available up until 2002, Wadhava and co-workers estimated the overall prevalence of HCV infection in 34 countries in sub-Saharan Africa to be 3% [11]. They documented large differences in the prevalence of the infection in the various regions studied. Although not expressly stated, with the possible exception of South Africa, where the individuals studied may have included some Caucasians, all those studied would have been Black Africans. The Central African region (the countries included were Burundi, Cameroon, Central African Republic, Chad, Congo, DR Congo, Equatorial Guinea, Gabon, Rwanda, Sudan, and Uganda) had the highest overall weighted prevalence of 6% [11]. Nine of the 10 countries in which it was possible to calculate the prevalence of HCV had an incidence greater than the sub-Saharan African median incidence of 2.2% [11]. The highest prevalence was in Cameroon (13.8%) and the lowest in Equatorial Guinea (1.7%).

The overall weighted average prevalence for the West African region (the countries included were Benin, Burkino Faso, Cote d’Ivoire, Gambia, Ghana, Guinea, Mauritania, Niger, Nigeria, Senegal, and Togo) was 2.4% [11]. Six of the countries in this region had an incidence higher than or equal to the sub-Saharan African median of 2.2%. The highest prevalence was in Guinea (5.5%) and the lowest in Mauritania (1.1%). The South and East African region (the countries included were Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Somalia, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe) had the lowest overall weighted average prevalence of 1.6% [11]. Only two of the twelve countries had a prevalence of or greater than the sub-Saharan African median. The highest prevalence was 3.2% in Tanzania and the lowest (0.1%) in South Africa.

The same analysis showed that the incidence of HCV infection in the individuals studied was age-related: the youngest age group (< 20 years) had a prevalence of 1.3%, those between 20 and 40 years 3.0%, and those over 40 years 12.0% [11].

Two studies in individual countries published subsequent to the analysis of Wadhava et al [11] supported their findings. A prevalence of chronic HCV infection of 2.0% was reported in Tanzania [12] (Wadhava et al had recorded an average prevalence of 3.2% [range 0.5–8.6] [11]), and of 1.71% in the Central African Republic [13] (the average prevalence recorded by Wadhava et al [11] was 2.4% [range 0–6.1]).

Little information has been recorded on the incidence of HCV infection in the Caucasian population of sub-Saharan Africa. In a study performed in the Natal province of South Africa, only 0.16% of the Caucasians tested were positive for HCV [10].

Hepatitis C virus-induced hepatocellular carcinoma in sub-Saharan Africa

Suggestions of a causal role for chronic HCV infection in HCC were originally provided by isolated reports of patients