PREVALENCE OF HEPATITIS B SURFACE ANTIGEN (HBSAG) IN 3 SELECTED COMMUNITIES IN THE ASHANTI REGION - GHANA

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SUMMARY

Between September and October 1991, a study was undertaken in 3 selected communities in the Ashanti Region of Ghana to determine Hepatitis B surface antigen (HBsAg) prevalence. The prevalence rates in Adwumakasekese, Komfo Anokye Teaching Hospital and Kumasi Central Prison were 9%, 6% and 17% respectively. There was no significant difference between the HBsAg prevalence in the 3 communities (p = 0.0687).

Keywords
Hepatitis B surface antigen (HBsAg), Hepatitis B vaccine, Prevalence, Communities in Ghana.

INTRODUCTION

The presence of Hepatitis B surface antigen (HBsAg) indicates either a current infection or a chronic carrier state. To differentiate between the two one would have to repeat the HBsAg status at least 6 months later or test for the presence of other hepatitis B virus (HBV) serological markers such as hepatitis B antibody (anti HBs) or hepatitis B core antibody (anti HBe). The patient is most likely to be infectious if the hepatitis B e antigen (HBeAg) is also present.

Approximately 10-20% of those having HBV infection develop the chronic carrier state. This state is associated with a higher incidence of cirrhosis, other chronic liver disease and hepatocellular carcinoma (HCC).

The association between HBsAg positivity and HCC has been demonstrated by prospective and retrospective seroepidemiological studies, demonstration of the integration of viral DNA into the chromosomes of host cells in liver cancer patients and chronic carriers of HBsAg and in animal models where viruses closely related to HBV reproducibly lead to the development of HCC.

In Africa, unlike other parts of the world, horizontal transmission of HBV plays a greater role than vertical spread. HBsAg has been found in the exudate of tropical ulcers and in pooled samples of mosquitoes, bed bugs and ticks. Skin contact and arthropods are likely to play a big role in the transmission of HBV.
The use of hepatitis B vaccine is likely to greatly reduce morbidity and mortality from chronic liver disease and HCC. Unfortunately, this vaccine is not routinely used in Ghana because it’s very expensive, costing many times more than the combined cost of all the Expanded Programme on Immunisation (EPI) vaccines.

So long as this vaccine remains expensive, prohibiting universal use in Ghana, it will be necessary to restrict its use to high-risk groups. These groups can only be identified by seroepidemiological surveys which have not been done on wide scale in Ghana\(^9\). It would also be interesting to note if any significant difference occurs in HBsAg positivity in different groups as a pointer to identifying increased risk factors to give a greater understanding of the route of transmission.

As Ghana changes socio-economically for the better, it would be important to have baseline surveys done on HBV serological markers as a basis for later comparison. In the future as the use of HB vaccine becomes routine in Ghana, it will be necessary to have prior baseline data in order to effectively interpret new morbidity and mortality data to assess the impact of a widespread HB vaccine campaign.

We sought to determine the prevalence of HBsAg in 3 selected communities in the Ashanti Region of Ghana.

**SUBJECTS AND METHODS**

The Ashanti Region is one of 10 administrative regions in Ghana, West Africa. Ghana has an area of about 240,000 km\(^2\) with a population of approximately 15 million. The Ashanti Region has thick forest with temperatures above 25°C all year, rising above 33°C in the months of April, May and June. Average rainfall is 1500mm/yr. Kumasi is the capital of the Ashanti Region.

The 3 communities selected for this study were Adwumakasekese, the Kumasi Central Prison and the Komfo Anokye Teaching Hospital.

Adwumakasekese is a rural forest community approximately 18km north-east of Kumasi with a population of 2,500 consisting mainly of farmers who live on a diet of yam, plantain, cocoyam and cassava. Meat is scarce and many young people have migrated to the urban areas.

The Kumasi Central Prison is situated near the centre of Kumasi. It is a medium security prison with a crowded and congested population of 1,300. Inmates are fed on poor starchy diet consisting mainly of tubers and are exposed to skin diseases (widespread scabies and chickenpox) and arthropod (ticks, mosquitoes, bed bugs infestations and bites).

The Komfo Anokye Teaching Hospital is an approximately 750 bed hospital with approximately 1,900 workers and is situated near the centre of Kumasi. The workers included in this study were Professional State Registered Nurses who have 5-10 years working experience. During the course of their work they are often exposed to blood and other patient exudates especially since gloves are in short supply.

Participants in the study which took place between September and October, 1991, were selected by simple random sampling with the only exclusion criteria being a past history of jaundice and blood transfusion. There were 101 prisoners, 115 people from the village of Adwumakasekese and 48 professional nurses from Komfo Anokye Teaching Hospital. After informed consent, a venous sample of blood was obtained. There were no refusals, the blood of subjects was screened for HBsAg using Latex Agglutination Kit supplied by Biotic Laboratories, Lightwater, Surrey, United Kingdom. The sera were used fresh or stored at 2 - 8°C for up to 48 hours before examination.
RESULTS

The group of the nurses were made up of 7 males and 41 females. The prisoners were all males. In the village we examined 60 males and 55 females.

Prevalence of HBsAg in samples taken from Adumakasekese, Komfo Anokye Teaching Hospital and Kumasi central prison were 9%, 6%, and 17% respectively. Table 1. 95% confidence intervals for the 3 communities are: Adumakasekese—3.7-14.3%; Hospital—0-12.8%; and Prison—9.6-24.4%.

There was no significant difference between the HBsAg prevalence in the 3 communities (p=0.0687). Similarly, stratified analysis for age and sex did not yield any significant differences.

DISCUSSION

The population of Adumakasekese was predominantly an elderly population though the HBsAg prevalence could be found mainly in the younger age groups. The explanation for this could be a warning of HBsAg positivity with age; 1% annually according to R.P. Beasly10 or because infectivity might have been less when the older population was young.

The hospital had a mainly young female population.

Carriage in females is known to be less than that in males11. This is to be contrasted with the mainly young male population of the prison which had a higher HBsAg prevalence.

Although the prevalence of HBsAg in the prison was higher than that in the village which was higher than that in the hospital, the differences would not be statistically significant if much larger sample sizes were employed.

It would also be interesting to conduct a similar study that would include other HBV serological markers such as HBeAg, HBsAB or HBCAB. This could throw light on whether infection in the 3 communities were recently or much earlier acquired, enabling us to relate the acquisition of HBsAg with the particular risks involved in the lifestyle of the communities (e.g. Handling of blood in hospital as opposed to high incidence of skin infections in prison). The prevalence results did not differ markedly form other studies done in West Africa12.

From this study, it is noted that there is high prevalence of HBsAg carriers in the three communities, the morbidity and mortality of HBV infection is high3,9. Knowledge of the mode of transmission of HBV in Ashanti Region is therefore important for the prevention of HBV infection.

REFERENCES


