

Full Length Research Paper

# Prevalence of HBs Antigen carriage in a population of recruits of the National Gendarmerie of Ivory Coast in 2010

Kra O<sup>1</sup>, N'Dri N<sup>3</sup>, Koné D<sup>1</sup>, Kadiané NJ<sup>1</sup>, Aba YT<sup>1</sup>, Ouattara B<sup>3</sup>, Bissagnéné E<sup>2</sup>

<sup>1</sup>Department of Public Health and Infectiology, Alassane Ouattara University, Bouaké, Ivory Coast.

<sup>2</sup>Department of Infectious diseases, Cocody University, Abidjan, Ivory Coast.

<sup>3</sup>Department of internal medicine, Alassane Ouattara University, Bouaké, Ivory Coast.

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Antigen HBs carriage is a major Health problem due to such severe complications as cirrhosis and liver cancer. The aim of this study was to determine the prevalence of Antigen HBs carriage within the recruits of the Ivorian Gendarmerie. It was a prospective cross-sectional study conducted from April 7, to September 12, 2010 at the Military Hospital of Abidjan. We included 891 male recruits whose mean age was 22.5 years [18- 26 years]. The prevalence of AgHBs carriage in this population of recruits was 15.6%. The prevalence of AgHBs carriage was higher in recruits aged 18 (24%), in married ones (33.3%), in those who had more than three sexual partners during the last 6 months preceding the survey (19.4%). This prevalence of AgHBs carriage was also high in recruits who had never used condom (20.6%) and those who had received blood transfusion (27%). The prevalence of HBs Ag carriage was high in the recruits of the Ivorian gendarmerie in 2010 notably in younger ones, those who had received blood transfusion and those with risky sexual behaviors.

**Key words:** HBs Antigen, Ivory Coast, gendarmerie, prevalence, recruits.

## INTRODUCTION

HBV infection constitutes a public health issue in developing countries owing to its high frequency and its lethality related to its severe complications like cirrhosis and primitive liver tumour (André, 2000; Pol *et al.*, 2007; Shepard *et al.*, 2006). These facts motivate its prevention in new-borns and workers at risk through vaccination. Several studies have been conducted in Ivory Coast on Hepatitis B in specific populations like blood donors (Kra *et al.*, 2007, Ehoussou *et al.*, 1997), polytransfused subjects particularly sickle-cell anaemia patients (Nahounou, 1991) and the general population (Sombo *et al.*, 1987). However what about the epidemiology of Hepatitis B within the army in general and in the recruits

of the national gendarmerie in particular? In this regards, our study aimed at contributing to the knowledge of HBs Ag carriage epidemiology in a population of recruits of the national gendarmerie in view of suggesting a strategy to fight against this disease in the armed forces of Ivory Coast.

## PATIENTS AND METHODS

### Patients

### Place of the Study

This work was conducted at the Military Hospital of Abidjan which is a reference centre in terms provision of health care to soldiers, their family and to the general population. It has a staff and facilities of third level hospitals in the pyramid of Health Care provision in Ivory Coast.

\*Corresponding author. E-mail: [ouffouek@yahoo.com](mailto:ouffouek@yahoo.com)

**Table I.** Prevalence of HBs Ag carriage according to socio-demographic characteristics.

<b>Sociodemographic Characteristics</b>	<b>Number</b>	<b>HBs Ag negative</b>	<b>HBs Ag positive</b>	<b>Prevalence (%)</b>	<b>p</b>
<b>Level of Education</b>					
- High School	628	527	101	16.1	0.539
- University	263	225	38	14.4	
<b>Residence</b>					
- Abidjan	690	577	113	16.4	0.067
- Province	201	175	26	12.9	
<b>Marital Status</b>					
- Single	823	694	129	15.6	0.646
- Concubine	65	56	9	13.8	
- Married	3	2	1	33.3	

**Study population:** our study related to the recruits who succeeded the competitive examination of non-commissioned officers of the national gendarmerie. Those recruits undergo a two-year training at the National Gendarmerie Training School which has an infirmary with medical and paramedical staff. Thus recruits have a regular medical follow up and are moreover subject to a vaccination programme including tetanus vaccine, Hepatitis B, typhoid fever, meningococcal meningitis and yellow fever vaccines. There were 891 male subjects of Ivorian nationality from all the regions of Ivory Coast selected out of 1010 recruits included further to the medical check-up prior to their final enlistment after a verbal informed consent.

## METHOD

### Type and period of study

It was a cross-sectional prospective, descriptive and analytical study conducted from April 07, to September 12, 2010 i.e. over a period of 5 months.

**Studied Parameters were as Follows:** Socio-demographic characteristics: age, place of residence, level of education, marital status.

Medical history of the last 6 months preceding the survey namely the number of sexual partners, sexual behavior, blood transfusion, intramuscular injection, the use of personal clippers for shaving and new blade razor for trimming nails.

The Biological examination carried out was HBs Ag dosage. HBs Ag was sought by means of two 4<sup>th</sup> generation ELISA tests (Biograd and Imotex) at the National Blood Transfusion Centre of Abidjan.

Data collected were analysed thanks to the EPI INFO

software.

The comparison of proportions was conducted by means of the Chi-square test also known as  $X^2$  test with Yates Correction or Fischer's Exact Test when the Chi-square Test application conditions were not met. The difference was statistically significant in case p-value  $\leq 0.05$ .

## RESULTS

### Overall prevalence of HBs Ag carriage

During the period under study, we recorded 891 male recruits with a mean age of 22.5 years [18 years-26 years] of whom 139 were carriers of HBs Ag, i.e. an overall prevalence of 15.6%.

### Specific prevalence of HBs Ag carriage in recruits based on socio-demographic characteristics

The prevalence of HBs Ag carriage was higher with recruits aged 18 years (24%) and those aged between 23 and 24 years (18.4%) as provided in table I.

Recruits aged between 18 years and 23 to 24 years were statistically more infected by HBV ( $p= 0.044$ )

HBs Ag prevalence in recruits was studied on the basis of their level of study, the place of residence and the marital status (table I). The prevalence of HBs Ag carriage in recruits was higher in those with high school level, those residing in Abidjan and married ones. However, in this study, the level of education, the place of residence and the fact of being married were not statistically associated to HBs Ag carriage ( $p>0,05$ ) (tableau I).

### Specific prevalence of HBs Ag carriage according to sexual behavior

**Table II.** Prevalence of HBs Ag carriage according to sexual behaviour.

Sexual behaviour	Number	HBs Ag negative	HBsAg positive	Prevalence (%)	P
<b>Number of sexual partners</b>					
- 0	204	172	32	15.7	0.899
- 1	419	355	64	15.7	
- 2	157	134	23	14.6	
- ≥ 3	65	53	12	18.4	
<b>Use of condoms</b>					
- Never	29	23	6	20.6	0.537
- Often	325	279	46	14.1	
- Always	491	412	79	16.1	

them were found to be HBs Ag carriers i.e. a prevalence of 15.5%. Eight recruits were found to be HBs Ag carriers out of the 46 recruits who had never had any sexual activity i.e. a prevalence of 17.4% but this difference of carriage was not statistically significant ( $p=0.731$ ).

The prevalence of HBs Ag carriage was higher with recruits who had had at least three sexual partners during the last six months preceding the survey, but the fact of having multiple sexual partners was not statistically associated to HBs Ag carriage with a value of  $p=0.899$  as provided in table II.

The prevalence of HBs Ag carriage was higher with recruits who had never used condoms (20.6%) but the difference between recruits who had protected sexual intercourses using condoms and recruits who had unprotected sexual intercourses was not statistically significant ( $p= 0.537$ ) as provided in table II.

#### **Prevalence of HBs Ag carriage according to the risk factor of the infection by the virus of hepatitis B**

The prevalence of HBs Ag carriage was higher in recruits who had undergone blood transfusion and in those who shared hair clippers with other people. But blood transfusion and hair clipper sharing were statistically not associated to HBs Ag carriage. The value of  $p$  was in respective order 0.250 and 0.095 as provided in table III.

#### **DISCUSSIONS**

This survey which is the first of its kind conducted on the recruits of the gendarmerie enabled us to specify the prevalence of HBs Ag carriage and study the risk factors of HBV transmission in this population from all the regions of Ivory Coast.

The prevalence of HBs Ag carriage was higher in recruits especially in younger ones aged 18 with a rate of 24%. This observation is compatible with the situation of hyperendemicity country where there is precocious transmission during the perinatal period or in early childhood [Rouet *et al.*, 2008; Lohouès *et al.*, 1998; Migliani *et al.*, 2000; Wang Zhan *et al.*, 1998]. It is worth mentioning that HBV vaccination was only included in the Expanded Programme of Immunization (EPI) in Ivory Coast recently (1999-2003). Those recruits had never had the opportunity to be immunized against the virus and could moreover have been infected in utero or during the perinatal period as suggested by the high transmission in recruits aged 18 years (Lohouès *et al.*, 1998; Rouet *et al.*, 2004; Sidibé *et al.*, 2001).

The prevalence of HBs Ag carriage was higher (16.4%) in recruits living in Abidjan than in those from other cities (12.9%). Like large African cities, Abidjan is also subject to promiscuity, risky sexual behaviours of youth, the lack of hygiene and difficulties of access to healthcare; factors which could cause the contamination of recruits (Bauduceau *et al.*, 2000; Benhamou *et al.*, 2007). Thus the prevalence of HBs Ag carriage was higher in recruits who had had at least three sexual partners (18.4%). The same observation was found in the work of Lewis-Ximenez *et al.* (2002) in Brasil (Lewis-Ximenez *et al.*, 2002) and Vildózola *et al.* (2006) in Peru and confirms thus the sexual transmission of HBV (Vildózola *et al.*, 2006). As a matter of fact, the recruits who used condoms on a regular basis were less infected than those who were not using condoms (16.2% versus 20.6%).

Our results underlie the efficiency of condoms in the prevention of Hepatitis B.

But in our study as well as in the study carried out by Estrada *et al* (2001) at Manila (Philippines), married recruits were the most affected (Estrada *et al.*, 2001).

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**Table III.** Prevalence of HBs Ag carriage according to the exposition of the 891 recruits to the virus of hepatitis B.

Exposition to the virus of hepatitis B	Number	HBsAg negative	HBsAg positive	Prevalence (%)	P
<b>Sharing of hair clippers</b>					
- Yes	403	336	67	16.6	0.250
- No	488	416	72	14.7	
<b>Sharing of razor blade</b>					
- Yes	226	194	32	10.2	0.282
- No	665	558	107	16.1	
<b>Intramuscular Injection</b>					
- Yes	161	137	24	14.9	0.788
- No	730	615	115	15.7	
<b>Blood Transfusion</b>					
- Yes	26	19	7	27.0	0.095
- No	865	733	132	15.3	

This fact can be explained by the exposition to various risk factors imputed to HBV. Parenteral and sexual exposition factors were covered in this study. Regarding parenteral exposition factors, the study was conducted on the basis of hair clipper, razor blade and intramuscular injection sharing. None of those factors was statistically associated to HBs Ag carriage unlike in the works of Kra *et al* (2007) (Kra *et al.*, 2007) which revealed in blood donors of Bouaké (Ivory Coast), a relation between intramuscular injection and HBs Ag carriage. The absence of parenteral and sexual risk factors formally identified in a population with high HBs Ag could be related to our methodology namely a transversal study; however mother-to-child transmission could be incriminated (Lohouès *et al.*, 1998).

However, awareness campaigns towards the general population, professional barbers and caregivers against the infection by microorganisms with parental transmission including HBV initiated for some years should be intensified.

## CONCLUSION

The prevalence of HBsAg carriage was high in the recruits of the Ivorian national gendarmerie especially in those with risky sexual behaviors, those who underwent blood transfusion and in recruits residing in Abidjan. The high prevalence of HBs Ag carriage in youths of the general population should call for the attention of health professionals in the strict application of standard precautions in the process of care provisions and their own immunization against Hepatitis B for protection.

The newborn vaccination policy as part of the Expanded Program of Immunization should include teenagers and adults who are yet to be immunized against HBV in the framework of a mass immunization in order to reduce the prevalence of that disease.

## CONFLICT OF INTEREST

The authors hereby declare that they do not have any conflict of interest regarding this article.

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