

Prevalence of the Surface Antigen of Hepatitis B Virus among Youth Aged 15 to 24 in TOGO in 2010

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Abstract

Background: In Togo, no overall prevalence of hepatitis B has been previously estimated and yet it is a country located in an area of high transmission of this virus. The objective of this study was to document the prevalence of HBs antigen among youth aged 15 to 24 in Togo in 2010 and its associated factors.

Method: This was a cross sectional study, conducted in 2010. It covers a serum bank samples of 2,101 obtained in the framework of a national survey on the prevalence of HIV/AIDS among subjects of both sexes aged 15 to 24 years. We collected socio-demographic data such as age, sex, location and area of residence, marital status and educational level. The HBs antigen screening was made by the 4th generation, "sandwich" type of ELISA test.

Results: A total of 2,101 young people aged 15 to 24 were included. The average age of respondents was 19.4 ± 2.8 years and the sex ratio was 0.9. The majority of respondents were single (78%). The prevalence of HBs Ag was 16.4%. It varied significantly with gender, marital status, place and region of residence. The male (19.2%) were more infected than females (13.9%). The central region was the most affected (27.7%), followed by Savanna (23.1%) and Kara (23.0%). Young people in rural areas (18.3%) were more infected than those in urban areas (14.9%).

Conclusion: This study shows a high prevalence of HBV among young people aged 15 to 24 years especially among those living in rural areas and in the northern regions of the country. This should encourage the strengthening of preventive action including vaccination in those areas.

Keywords: HBsAg; Prevalence; 15 to 24 years; Togo

Background

The surface antigen, HBsAg is a good marker in the estimation of the number of hepatitis B virus (HBV) carriers among a population because its presence shows either an acute viral hepatitis B or a chronic carriage state of the HBV [1-3]. In this regard, the prevalence of HBs Ag can be superposed on the prevalence of HBV. First marker of HBV infection, HBsAg can be detected 2 to 12 weeks after the infection [4]. It increases, reaches its maximum after 3 and 4 months and then gradually decreases and disappears after 6 months for a cured hepatitis. If after 6 months, it persists, we talk of chronic carrier and it will remain present throughout life [5]. The HBV is an hepatic tropism virus the inflammation of which can become chronic and lead to cirrhosis or hepatic carcinoma [6-8].

The HBV infection is a global problem, because three quarters of the world population live in areas where the prevalence of chronic hepatitis of HBV reaches 2% or more [9]. According to the World Health Organization (WHO), more than 2 billion people worldwide present symptoms of HBV infection [10-12] and between 350 and 400

million people are chronic carriers [9,11]. The number of acute hepatitis is estimated to over 5 million. HBV is responsible for 60 to 80% of hepatic carcinomas reported worldwide with consequent annual number of deaths estimated to between 500,000 and 1.2 million [10,12].

Africa is one of the continents most affected with prevalence ranging between 5 to 20% or more [13-15].

HBV transmission is made through contact with blood and body fluids of individuals, from mother to child and through sexual intercourses [16,17]. The sexually active age group of 15 to 49 years is a population at risk [18].

Togo is located in a high endemic area. In this country previous studies have given different figures according to the region and the target groups: 8.7% for volunteer blood donors at the Regional Blood Transfusion Centre (CRTS) of Sokode (central region) in 2004 [19] and 19.7% in 2008 [20], 4.7% among volunteer blood donors at the National Blood Transfusion Center (CNTS) in Lomé (Maritime region) in 2008 [20], 10.8% among patients diagnosed at National Institute of Hygiene (INH) in 2008 [21]. Data in the age group 15 to 24 years are poorly documented in Togo. This study aims to estimate the

prevalence of HBs Ag among youth aged 15 to 24 in Togo in 2010 and to identify associated factors.

Method

Study design

This was a cross sectional study conducted in 2010 throughout the togolese countrywide. Laboratory tests were conducted in the laboratories of the National Institute of Hygiene in Togo.

Study population and sampling

The study focused on individuals of both genders aged 15 to 24 who were residing in the country during the study period. We used the serum bank obtained after a national survey on the prevalence of HIV/AIDS among youth aged 15 to 24 years. The sampling was random and stratified at two degree [18].

Study variables and laboratory tests

The studied variables were age, sex, location (urban, rural) and region of residence, education level, occupation and marital status. They were obtained from the survey questionnaire on HIV [18] a part from the presence of HBs Ag that we tested newly during this study. The screening of HBs antigen was made by the ELISA test “HBs Ag Ultra Monolisa™”. This test uses antibodies against different subtypes of HBsAg. The results were expressed qualitatively: positive or negative.

Data analysis

Univariate association between HBsAg positivity and young characteristics was assessed by means of odds ratios (ORs) and by χ^2 with 95% CIs. Data management and analysis were performed by using Epi Info 3.5. 1.

| Characteristics | Socio Demographics | Number | Percentage |
|-----------------|--------------------|--------|------------|
| Sex | Female | 1102 | 52.5 |
| | Male | 999 | 47.5 |
| Age | 15 to 19 | 1105 | 52.6 |
| | 20 to 24 | 996 | 47.4 |
| School Level | Primary | 62 | 3.0 |
| | Secondary | 1323 | 63.0 |
| | University | 166 | 7.9 |
| | Did not attend | 550 | 26.1 |
| Marital Status | Single | 1638 | 78.0 |
| | Married | 323 | 15.4 |
| | Others | 140 | 6.6 |
| Region | Lome | 470 | 23.4 |
| | Maritime | 385 | 18.3 |
| | Plateaux | 376 | 18.9 |
| | Central | 267 | 12.7 |
| | Kara | 317 | 15.1 |
| | Savanna | 286 | 13.6 |
| Area | Urban | 1173 | 55.8 |
| | Rural | 928 | 44.2 |

Others^a=Free union, widowed, divorced and unspecified.

Table 1: Socio-demographic characteristics of the respondents (N=2101).

Ethical issues

This study has received the authorization from the ethics committee of human health research of ministry of health.

Results

A total of 2,101 young people aged 15 to 24 were included. The average age of the respondents was 19.4 ± 2.8 years and the sex ratio

(M/F) was 0.9. The majority of the respondents were single (78%), 63% had a primary level and 23.4% resided in Lomé commune Table 1.

The prevalence of HBs Ag among the studied population was 16.4%. Males were more infected than women ($p=0.001$). The central region was the most affected (27.7%) followed by the Savanna region (23.1%)

and the Kara region (23.0%). Young people in rural areas are more likely to be infected than those in urban areas (RR=1.227, 95% CI=[1.013; 1.489]). Table 2 shows the variations in this prevalence according to the socio-demographic characteristics.

| Serological Status of HBs Ag | | | | |
|--|----------|----------|-----------------|-------|
| | Positive | Negative | Prevalence in % | p |
| Overall Prevalence | 345 | 1756 | 16.4 | - |
| Sex | | | | |
| Female | 153 | 949 | 13.9 | 0.001 |
| Male | 192 | 807 | 19.2 | |
| Age Group | | | | |
| 15 to 19 | 180 | 925 | 16.3 | 0.910 |
| 20 to 24 | 165 | 831 | 16.6 | |
| Education Level | | | | |
| Primary | 12 | 50 | 19.4 | 0.390 |
| Secondary | 227 | 1096 | 17.2 | |
| University | 21 | 145 | 12.7 | |
| Illiterate | 85 | 465 | 15.5 | |
| Marital Status | | | | |
| Single | 260 | 1378 | 15.9 | 0.017 |
| Married | 50 | 273 | 15.5 | |
| Others | 35 | 105 | 25.0 | |
| Region | | | | |
| Lome | 32 | 438 | 6.8 | 0.000 |
| Maritime | 35 | 350 | 9.1 | |
| Plateaux | 65 | 311 | 17.3 | |
| Centrale | 74 | 193 | 27.7 | |
| Kara | 73 | 244 | 23.0 | |
| Savanna | 66 | 220 | 23.1 | |
| Area | | | | |
| Rural | 170 | 758 | 18.3 | 0.042 |
| Urban | 175 | 998 | 14.9 | |
| Others ^a =Free union, widowed, divorced and unspecified | | | | |

Table 2: Prevalence of HBs Ag among youth aged 15 to 24 by socio- demographic characteristics.

Discussion

This study estimated the prevalence of HBs Ag in individuals aged 15 to 24 years in Togo and identified some associated risk factors. This is the first study of its kind in Togo. It is also one of the few studies in

African sub Saharan region that includes sexually active youth and young adolescent groups.

The prevalence of HBs Ag in our study was 16.4%. It was close to the 13.8% reported in Ghana in 2011 among rural blood donors aged 17 to

60 years [22] and is lower than the 23.9% found by Emmanuel et al. in 2013 in northern Uganda among the same age group as ours [23]. These high prevalence rates are probably due to difficult living conditions in rural areas and to the non-inclusion of hepatitis B vaccination programs in these countries before these studies [24,25]. The Extended Program of Immunization in Togo did not include the vaccine against hepatitis B until 2008. This prevalence is higher than the 2.2% reported by Daw et al. in 2014 in Libya [26]. This difference could be due to local epidemiology including contamination at a very early age in life. These results confirm the literature data showing high prevalence rates (8-20%) in Black Africa [27-29] and low rates in the Maghreb [30,31].

We found a link between the prevalence of HBs Ag and sex, marital status, region and place of residence.

The prevalence of HBs Ag was higher among men than among women ($p=0.001$). The same observations were made by Emmanuel and al. Uganda [23] (22.2% for men and 15.3% women; $p=0.032$) and Deng et al. China in 2013 [32] (6.5% for men and 3.9% for women; $p < 0.001$). Agbenu et al. in Togo in 2008 [21] on the other hand, did not find significant differences and this is probably due to the small size of the population touched by the study.

Married and singles were less infected compared to other marital situations (unmarried couples, widowed, divorced and unspecified) with a significant difference ($p=0.017$). Deng et al. in China found that celibacy and sexual multi-partnership ($p=0.049$) were associated with high prevalence of HBs Ag [23]. Persons living in undefined marital status are likely to display more at risk behaviors such as sexual multi-partnership because the risk of infection increases with the number of sexual partners, the number of years of sexual activity and the presence or absence of other sexually transmitted diseases [33].

Our study showed a significant difference in the prevalence of HBs Ag through the different regions of the country. The three northern regions of the country were more infected. These three northern regions are characterized by a high incidence of poverty (77.7% to 90.5% of individuals are poor) [34]. This precarious economic situations favor HBV infection.

Our study also showed a significant difference in the prevalence of HBs Ag between rural and urban areas. Poverty observed in rural areas [34] and promiscuity favoring exchanges of body fluids such as saliva, urine and blood could explain this situation. The prevalence of HBs Ag is related to age, socio-economic conditions, socio-professional status and risk behavior such as sharing towels, chewing gum, lollipops, and scratching back of carriers [24,25].

With regard to other factors such as age and education level, our study showed no significant difference in prevalence of HBs Ag. Emmanuel et al. [23] have not found any significant difference according to age ($p=0.575$) either. Other studies have, on the other hand, reported that having an education which is less than Alevel was a risk factor for the presence of serological markers of HBV [35,36].

Conclusion

The HBV prevalence estimated to 16.4% in Togo among youth aged 15 to 24 should encourage the establishment of a national program against HBV with more sensitization in the northern areas. The introducing of the vaccine against hepatitis B in the Extended Program of Immunization is an action in favor of long term reduction of the infection but in the short term, sensitization could curb infections

among adults. A further study is needed to identify the factors promoting infection in the northern regions of Togo.

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Conflicts of Interest

The authors declare that they have no competing interests.

Authors' contribution

AKB conceived, designed, compiled data for the article and wrote the article KTG and WAH: they participated in the interpretation of results, in writing and reviewing the manuscript

YL and KA and IM: compiled and analyse data for the article. TT, LF and AV: contributed in the manuscript design and provide comments on the manuscript. PP: conceived and designed the survey. All the authors have read and approved the final manuscript to be submitted for publication.

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