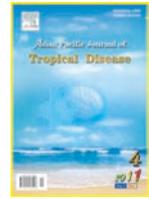




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Co-infection of HIV and HBV in voluntary counseling and testing center in Abidjan

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ABSTRACT

Objective: To evaluate the co-infection of hepatitis B virus (HBV) and immune deficiency virus (HIV) among clients consulting at the Voluntary Counseling and Testing Center (VCT Center) of the Institut Pasteur de Côte d'Ivoire (IPCI). **Methods:** A cross-sectional study was conducted from April to June 2010 at the VCT of IPCI. All clients attending the VCT of IPCI for HIV test after having signed the informed consent form were included in the study. Venous blood samples were collected from the clients after an interview. Then the rapid tests for screening of HIV infection (Determine HIV 1/2 of Abbott and Genie II HIV-1/HIV-2, Bio-Rad) were performed. As for hepatitis B surface antigen (HBsAg) test, it was performed using ELISA test system using Monolisa HBsAg Ultra-Bio-Rad. **Results:** Of 278 samples analyzed, 30 were positive to antibody against HIV-1, giving a seroprevalence of about 10.8%, and 35 were positive to HBsAg, giving a seroprevalence of 12.6%. As for co-infection of HIV and HBV, it was 7/278 cases about 2.5%. **Conclusions:** It can be concluded that co-infection of HBV and HIV is relatively low among clients consulting at the VCT of the IPCI. Serological surveillance should be systematic in various HIV testing centers in the country. The use of rapid tests for detection of HBsAg allows a lot of tests to be realized. However, the choice of these tests depends on the evaluation results in reference laboratories and situation on ground.

1. Introduction

The World Health Organization (WHO) estimates that 2 billion people are or have been infected with HBV, among which 370 to 400 million are chronically infected^[1]. Hepatitis B causes the death of one to two million people per year^[1,2]. Indeed, the highly contagious virus is present in most body fluids including blood, semen, vaginal secretions and even, to a lesser extent, saliva. That is why the WHO ranks the virus, as well as HIV, among the ten leading causes of death from infectious disease^[3]. Yet for over 20 years,

HBV effective prophylaxis by vaccination has been used. In Côte d'Ivoire, seroprevalence of hepatitis B surface antigen (HBsAg) was estimated to about 9% of the general population^[4].

Côte d'Ivoire is the most affected country in West Africa, the prevalence of HIV/AIDS is 3.4% according to a national survey on indicators of seroprevalence of HIV/AIDS, about 750 000 people living with HIV (PLHIV) in 2009^[5,6]. These two viral diseases have common features in terms of epidemiology and evolution^[7-9]. In Côte d'Ivoire, in a cohort of 439 HIV positive patients taking treatment in the department of infectious diseases, co-infection of HIV and HBV was 27%^[6]. In case of co-infection of HIV and HBV, there is generally a higher risk of progression to chronic state. Also among PLHIV on antiretroviral therapy (ARV) and tritherapy (HAART), an immune reconstitution inflammatory syndrome has been described^[10,11]. As a result, with PLHIV prior to commencement of HAART, it is recommended to

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screen for HBV. Hence, the aim of our study is to improve the medical care of clients consulting at various testing centers. The overall objective was to detect the co-infection of HIV and HBV among the clients consulting at the Voluntary Counseling and Testing Center (VCT).

2. Materials and methods

This study was a descriptive cross-sectional study that was conducted over a period of 3 months from April to June 2010 from the consultation realized at the VCT of the Institut Pasteur de Côte d'Ivoire (IPCI). Analyses were performed at the Unit of Bacterial and Viral Serology of the Institute.

2.1. The study population

A total of 278 clients attending the IPCI for voluntary counseling and testing for HIV infection after signing the consent form were included in the study. The sample size was calculated using the method of estimating the prevalence which provides the minimum size of the sample. The confidence interval selected was 95% with a precision of 3%.

For each client a questionnaire, seeking information on items like sociodemographic data, medical history, surgical and risk factors for blood transmission diseases was to be filled.

2.2. Biological analysis

The biological assays for anti-HIV antibodies were done by rapid tests using client serum (Determine HIV-1/2 of Inverness Medical and / or Genie R II HIV-1 and 2 by Bio-Rad according to national algorithm on screening in effect)[6].

The detection of HBsAg was performed by immunoassay (ELISA Testing System) using Monolisa HBsAg Ultra Bio-Rad kit according to manufacturer's procedures.

To ensure the authenticity of results, internal control "home" positive and negative were introduced to each series

of analysis result regardless of positive and negative controls of the manufacturer.

2.3. Statistical analysis

The information collected from each client participating in the study was analyzed using the software Sphinx and entered using Microsoft Word 2003.

Seroprevalence was calculated with a confidence interval of 95%.

3. Results

3.1. Sociodemographic and clinical data

The female sex predominated with 54.7% with a sex ratio of 0.82. The majority of clients were students with 45.7% followed by salaried workers, workers in the informal sector and unemployed with a prevalence of 31.7%, 17.3%, and 5.4%, respectively. Most clients about 89.2% did not mention any past medical and surgical history. The knowledge of risk involved by the past blood transfusion history (14, 5%), tattoos or cutting (49, 17.6%), use of unsterilized syringes (1, 0.4%) was reported by 64 subjects (23%). The past liver disease problem was recognized by 65.4% of subjects, it was family jaundice and personal jaundice with a prevalence of 19.8% and 10.4%, respectively. The concept of fatigue was found in 14% and pruritus in 11.5%. While past digestive problem, and fever were reported by 6.8% and 2.9% of customers, respectively. As for past extrahepatic history, they were reported by 35.9% of cases, of the type urinary problems, joint pain, and vascular disorders, by 3.2%, 21.9%, and 10.8% of clients surveyed, respectively. Finally, 15.1% of subjects had previous surgical history.

3.2. Seroprevalence of HIV and HBV

Thirty out of 278 clients were tested positive to HIV, a seroprevalence of 10.8% exclusively HIV-1. Thirty-five out of

Table 1

Relationship between status and gender [n (%)].

Status / gender	Female	Male	Total
HBsAg +	9 (32.1)	19 (67.9)	28 (100.0)
Co-infection of HIV and HBV	4 (57.1)	3 (42.9)	7 (100.0)
HIV +	12 (52.2)	11 (47.8)	23 (100.0)
Total	25 (43.1)	33 (56.9)	58 (100.0)

Table 2

Relationship between status and profession [n (%)].

Status / profession	Student	Worker	No work	Worker in informal sector	Total
HBsAg +	8 (28.6)	9 (32.1)	2 (7.1)	9 (32.1)	28 (100.0)
Co-infection of HIV and HBV	1 (14.3)	1 (14.3)	2 (28.6)	3 (42.9)	7 (100.0)
HIV +	7 (30.4)	6 (26.1)	3 (13.0)	7 (30.4)	23 (100.0)
Total	16 (27.6)	16 (27.6)	7 (12.1)	19 (32.8)	58 (100.0)

278 clients were tested positive to HBsAg, a seroprevalence of 12.6%. Among the clients infected, about 44.8% were aged between 20 and 30 years. The male was predominant with 56.9% giving a sex ratio of 1.32 and 96.5% of clients tested positive to HIV and HBV had past history of liver disease.

3.3. Co-infection with HIV-HBV

Among the 278 clients, 7 or 2.5% had a co-infection of HIV and HBV, while 58 customers or 20.9% were mono-infected with either HIV or HBV. Among these HIV-positive clients, 7 or 12.1% had a co-infection of HIV and HBV. The age range of 20-29 years and 30-40 years had a higher rate of co-infection with 28.6% each, and 57.1% of co-infected clients were female (Table 1). However, there was no significant difference between age and gender of mono-infected and co-infected clients. The prevalence of co-infection in our study varied across occupational classes. The highest rate was observed in workers of the informal sector with 42.6%. All co-infected subjects had past history of liver disease (Table 2).

4. Discussion

4.1. The demographic and clinical characteristics

In our study, adult population under 30 years was the most represented. These results are lower than those reported by Kouame^[12] and Sissoko^[13] with 30 to 39 years and 35 to 55 years, respectively. On the contrary, our results are similar to those of Coulibaly^[14] with an age range of 25-34 and by Omolu *et al* in Nigeria with an age range of 18-28^[15]. These results could be explained by the fact that it is the younger population that is more motivated to go for test for HIV/AIDS.

Moreover, the predominance of female clients in the VCT found in our study and other studies^[12,16] is in contrary to similar but previous studies^[13,15-19]. Awareness campaigns which much more focused on women in recent years no doubt have had an impact. The predominance of pupils and students could be explained due to the fact that it is the target group awareness campaigns had been focused on against sexually transmitted diseases (STD). Diallo^[13], in a similar study in patients co-infected with HIV and HBV, reported a predominance of the workers in the informal sector with 28.6%. This difference is explained by the choice of study population represented by patients. The predominance of liver diseases in past clinical history is related to the unspecific signs of liver infection.

4.2. Seroprevalence of HIV and HBV

The seroprevalence found in our study is higher than that of the general population which is 4.7% according to a survey of AIDS indicators at national level^[6]. Our results are similar to those found by some authors^[20-22]. Thus in Nigeria, a prevalence of 10% was reported among blood donors^[15].

In Côte d'Ivoire, Sissoko reported 11.9% in the

hemodialysis population^[13]. However, other authors reported lower prevalence rates, especially in Mali with a prevalence of 3.5% among women seeking prenatal consultation^[20] and 1.7% in the general population according to EDS III conducted in 2001^[21]. This high prevalence in patients consulting in a VCT could be explained by the fact that Côte d'Ivoire is one of the countries most affected by HIV in West Africa. The prevalence of HIV-1 was confirmed by several authors^[15-17,24-26]. The predominance of female having HIV infection was confirmed by several studies. Ba and Sissoko reported 65.3% and 61.5% female, respectively^[16]. Concerning the occupation, the predominance of students and those in the informal sector could be explained because of ignorance, and poverty recognized as causes of spread of HIV infection.

The prevalence of HBsAg was superimposed to that found in Nigeria^[15] and Ghana^[27]. In contrary, this rate is lower in Mali with 24.9%^[14]. Dembele reported 17.37% in his study^[18]. However, other studies have found lower seroprevalence among certain populations at risk, especially in hemodialysis patients with 8.3%^[13]. However, in populations' supposedly healthy like blood donors also lower rates were reported about 2.2%^[15]. The mode of transmission of HBV is superimposed to that of HIV infection thus it is the sexually active population that is exposing themselves to more risk, which is the most infected^[28]. These figures are consistent with those found by other studies. Thus, Coulibaly^[14] reported that the age range of 25 to 34 was the most affected with a prevalence of 29.7%. Umolu *et al* in Nigeria reported that age group of 18-28 years was the most exposed^[15] in contrary to Sissoko^[13] and Diallo^[17] who reported that the most highly exposed population were over 30 years. As for sex, the male predominance was also found in other studies in Europe^[5] and Africa^[14,15].

4.3. Co-infection of HIV and HBV

The rate of co-infection of HIV and HBV was lower than that of Kouame with 27%^[13], Balogun with 28.4%^[15], Guindo with 27.87%^[19]. Age groups constituting the population of young adults engaged in active sexual activity have the highest rate. This was confirmed by Diallo^[16] and Guindo^[19]. Older people may have obtained the infection in their younger age. Women were the most co-infected, just as the study of Ba^[12].

Studies have reported different data. Diallo has found prevalence in favor of men 56.52% against 43.48% for women. The prevalence of co-infection in our study varied across occupational and social classes. The personal or family medical history may be relevant to liver disease which was mentioned by all co-infected clients. This could be explained by the fact that co-infection is a predisposing factor for immunosuppression, therefore, it could lead to the spread of many opportunistic diseases.

The seroprevalence of co-infection of HIV and HBV among clients consulting at VCT of the IPCI is relatively low. However, the HBsAg prevalence is worrying. Serological surveillance of HBV should be systematic in various testing centers for HIV in the country^[29-31]. Especially since, it

appears no specific risk factors of co-infection. The use of rapid tests for detection of HBsAg allows a lot of tests to be realized. Nevertheless, the choice of these tests depends on the evaluation results in reference laboratories and situation on ground.

Conflict of interest statement

We declare that we have no conflict of interest.

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