Original Research Article

Prevalence of HIV, HBV and Chlamydia Infections in Cameroonian University Context: Case of the University of Dschang, in the Western Region

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ABSTRACT

Introduction: In sub-Saharan Africa HIV infection remains largely epidemic, whereas HBV infection is highly endemic (>8%). In Cameroon, HIV prevalence is 4.3%. Concerning HBV and chlamydia infections, their prevalence are both ≥10%. Young adults, including university students, are the population groups mostly affected. Epidemiological data on these infections, among university students could be helpful to implement specific prevention strategies.
Methods: A descriptive study was performed in May 2013 among 624 students from the University of Dschang, Cameroon. Participants were screened for HIV, HBV and Chlamydia infections. Data was collected by a standard questionnaire and analyzed by Epi Info.
Results: Average age of participants was 23.3 years (σ = 3.2) with female predominance (58.7%). Prevalence of HIV, HBV and Chlamydia infection was 1.1% (7/624), 2.8% (5/176) and 2.0% (2/100) respectively. 83.2% of participants were sexually active. Concerning sexual risk behaviors, participants reported having multi partners (14.8%), using condom occasionally (58.6%) or never (5.0%). 100%, 62.6% and 52.2% reported to be aware on HIV, HBV and Chlamydia infections respectively. In addition, only 5.5% and 21.3% of the participants were aware of their HBV and Chlamydia status respectively, versus 64.4% for HIV. The excessive cost of HBV and Chlamydia tests has been identified as the major barrier to testing (87.6%).
Conclusion: Among college Cameroonian students the prevalence of HIV, HBV and Chlamydia infections seems to be relatively low if compared to general population. However, having multiple sexual partners in addition to non-systematic use of condoms during sexual intercourse represents risk behaviors among students. Awareness campaigns and screening facilitation on HBV and chlamydia infections need to be strengthened.

Keywords: Prevalence; HIV; Hepatitis B Virus; Chlamydia; Risk behavior.

INTRODUCTION

In the late 2004, the United Nations program for HIV / AIDS (UNAIDS) estimated the total number of people living with HIV / AIDS in the world to be 39.4 millions of which 37.2 millions were adults.

[1] According to the UNAIDS 2009 report "Focus on the AIDS epidemic", approximately 33.4 million people lived with the AIDS virus; 22.4 millions located in Sub-Saharan Africa. [1] The same source states that the number of new infections has reduced by 17% over the past eight years. Moreover, the UN/AIDS 2012 report mentions that the evolution of HIV/AIDS in the world has definitely taken a new direction the in recent years. The number of people living with HIV (PLHIV) in late 2011 was estimated at 34 million, an increase of 17% compared to 2001. According to Demographic Health Survey (DHS-MICS IV) conducted by the National Institute of Statistics (INS) in 2011, HIV prevalence in Cameroon is 4.3%.

The seroprevalence of viral hepatitis C and E, in Africa and in some parts of the world have been investigated and documented by several researchers. [2-10] However, studies relating on the seroprevalence of hepatitis B virus is less common. The data remain stacked at blood banks and departments of epidemiological surveillance of viral hepatitis B. The distribution of the prevalence of HBsAg carriers in the world leads to the identification of three zones corresponding to different transmission modes and risk exposure: high endemic countries (sub-Saharan Africa, Southeast Asia, the Amazon basin), where the prevalence of HBsAg is between 8 and 20%; intermediate prevalence countries (Middle East, Central and South America, Central Asia and some countries in Southern Europe) where the prevalence of HBsAg is between 2 and 7% and low endemic countries (Western and northern Europe, North America, Australia ...) where the prevalence is less than 2%. [11]

Chlamydia seroprevalence varies from one point of the globe to the other, but in general seems quite high in the world's population. Indeed, prevalence's reported in literature vary from 1 to 5% in asymptomatic populations and 8 to 15% in symptomatic populations. They are highest among women aged 18-24 and men 25-30 years and vary depending on the population recruitment area (family planning clinics, sexually transmitted diseases screening centers, liberal gynecologists, general etc.). [12] This infection is not well known in Cameroon and needs to be deeply investigated and published. [13]

These three infections have similar modes of transmission and risk factors. They are transmitted through body fluids, unprotected sex, the collective use of sharp objects and others. [14,15] In addition, HIV infection is known to be the cause of the depressed immunological state leading to the outcome of several other infections including viral hepatitis B and chlamydia. [16,17]

Studies have been conducted in several African countries to assess the impact of HIV and AIDS on the educational system. [18-20] The student environment is peculiar as it stands as an opportunity for diverse discoveries and experimentation for many teenagers and young adults (15-49 years), hence the importance of understanding the degree of knowledge of the later on their sexual behavior.

Beyond this investigation, and in order to explore new strategic axes to fight against these sexually transmitted infections in the youth milieu, this study aimed at determining the seroprevalence of HIV, HBV, Chlamydia and associated risk factors among students of the University of Dschang.

MATERIALS AND METHODS
Place of study
Cameroon is a country located in central Africa sub-region. It covers a surface area of 475,443 km2 and has 10 regions. The official languages are French and English. The last population census estimated the population to more than 20

million inhabitants. This study was implemented in the Western region of Cameroon; specifically in the town of Dschang which is the Head of the Department of the Menoua and a university city. Figure 1 gives an overview of the location of the town of Dschang. The University of Dschang has more than 25,000 students coming from all ten regions. There are two professional schools and five faculties, namely the Institute of Fine Arts Fumban (IBAF); Bandjoun University Institute of Technology (IUT); Faculty of Agronomy and Agricultural Sciences (FASA), Faculty of Arts and Human Sciences (FLSH), Faculty of Economics and Management (FSEG); Faculty of Law and Political Sciences (FSJP) and the Faculty of Science (FS). The FS includes eight departments including the Department of Biomedical Sciences where this study was conceived.

Study population and data collection tool

A cross-sectional descriptive study was conducted during the month of May 2013 on the students' population of the University of Dschang. The sampling method was consecutive and the sample size was exhaustive. The data collection tool was a standard anonymous questionnaire. The questionnaire was self-administered and the information collected focused on variables such as: knowledge on HIV, viral hepatitis B and chlamydia; protection means; condom use, HIV testing and risk behaviors.

Knowledge on HIV/HVB/ Chlamydia had as indicators the level of knowledge about the ways of transmission and means of prevention.

The means of protection had as indicators, the use of a condom (male or female), abstinence or fidelity.

Systematic or occasional condom (male or female) use during sex was considered as indicators of condom use.

The indicators of risk behaviour included multiple partners (number of sexual partners), not using a condom during sex, the type of sexual partner and the type of sexual intercourse (vaginal, oral or anal).

The testing had as indicator, the effectiveness of the screening test and withdrawal of the results.

Biological tests

During this investigation, three biological tests were performed: HIV screening, HBV and chlamydia serology.

HIV serology was free of charge for each participating student. The diagnosis was performed using algorithm in series and the test used was that of Determine.

Concerning HBV screening, students should paid 500 FCFA (1$ USA); one sixteenth of what they would normally pay if they went to a hospital or clinic. The diagnosis was made using the Rapid Diagnosis Test *DiaSpot HBsAg* (sensitivity 99.0%, specificity 97.0%).

Students should also paid 500 FCFA(1$ USA) for chlamydia serology, about 1/20th of the normal price in the health facilities. The diagnosis was carried out using the Rapid Diagnosis Test *One-Step Chlamydia Test* (sensitivity 99.9%, specificity 98.0%).

Statistical Analysis

Questionnaires with incomplete or inconsistent data were eliminated and not considered during the phases of data entry and analysis. Entry and data analysis was done using Epi Info software, version 3.5.3. Proportions, frequencies and means were used to describe the various data. Figures and tables were obtained by the help of Microsoft office Excel and Word 2007.

RESULTS

Base line characteristics of the study population

A total of 624 students were interviewed during this study. The age of the study participants ranged between 18 and 44 years, with an average age of 23.3 years ($\sigma = 3.2$). The female sex was the most represented (58.7%, n = 366). As shown in

Figure 2, most of the students interviewed were undergraduates. Regarding the marital status: 98.2% reported being unmarried, 1% said they lived with a partner without being married while 0.8% reported being married.
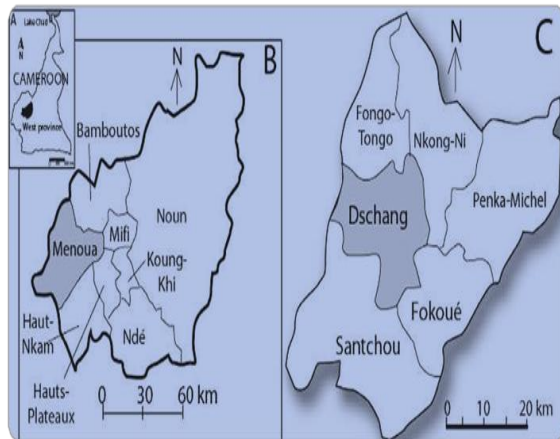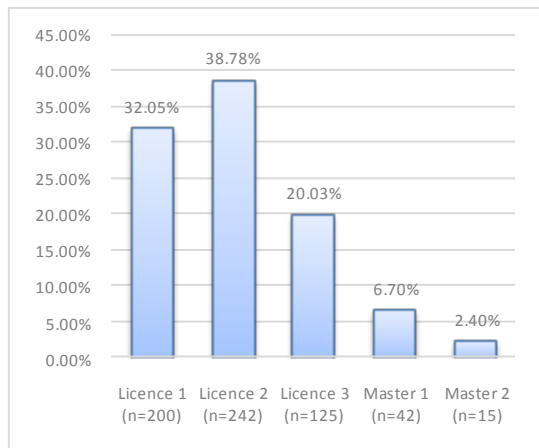

Figure 1: Localization of Dschang town.

Figure 2: Study level of different participants.

Knowledge on HIV / AIDS, HBV, and Chlamydia

Table 1 shows in details the results of knowledge on HIV, viral hepatitis B and chlamydia. From this survey it appears that all students interviewed had good knowledge on HIV/AIDS. However, regarding Viral Hepatitis B and Chlamydia, their knowledge was much more limited. Moreover, we observe that there is a large gap between the proportion of students who know their HIV status (64.4%, n = 402) and

those who know their HBV (5.5%, n = 34) and Chlamydia (21.3%, n = 133) status. On the other hand, among those who knew their Chlamydia and HBV status, 57.1% and 45.5% respectively mentioned that the test had been done more than 1 year ago. The main reason (87.6%) regarding the lack of information on personal HBV and Chlamydia status was related to the high fee of these two tests. Indeed, 75% of students coming for their HBV and Chlamydia screening test, said they did this not only because of the importance of being aware of their status on these two diseases but also because of the very affordable fee of these two tests during our investigation. The results of this survey also reveal that respectively 68.4% and 63.4% ignore the fact that HBV and chlamydia are asymptomatic STIs; 17% are still unaware that chlamydia can lead to infertility and 34.6% are unaware that HBV may can to death.

Sexual practices and risk behavior

Table 2 summarizes according to sex, the different risky sexual behaviors among students observed regarding STI/HIV/AIDS. The proportion of students who mentioned to be sexually active was 83.2% (519/624). Among risk behaviors identified, 14.8% (77/519) of the respondents reported having sexual intercourse with more than one sexual partner during the previous three months. More importantly, these students approved they did not always use condoms during sex. In fact, 36.4% (189/519) said they always used a condom during sex, against 58.6% (304/519) occasional users. On the other hand, 5% (26/519) said they had never used a condom during their sexual intercourse despite the fact that the sexual partner was not regular. Furthermore, 32.8% (170/519) reported having had sex with casual partners and 67.2% (349/519) with regular partners. We also noted that there is a difference

thought non-significant between the proportion of male and female students who adopt risky behaviors such as having multiple sexual partners (p = 0.74)

Table 01: Knowledge on STIs/HIV/Aids

Variable	HIV/Aids		HBV		Chlamydia	
	N	%	n	%	n	%
Awareness	624	100,0	390	62,5	326	52,2
Good knowledge on transmission routes	585	93,8	173	27,7	285	45,7
Good knowledge on prevention methods	607	97,3	285	45,7	477	76,4
Aware of the serological status	402	64,4	34	5,5	133	21,3

The values represent the number and percentages (%) of students who have good knowledge on transmission routes and methods of preventing HIV, Hepatitis B virus infection and chlamydia.

Table 02: Sexual risk behaviours according to sex

Characteristics	Male (N=258)		Female (N=366)		Total (N=624)		p-value (α=0,05)
	Effectif	%	Effectif	%	Effectif	%	
Sexually active.	221	85,7	298	81,4	519	83,2	0,53
Had more than one sexual partner during the previous 3 months. (Multisexual partnership).	51	23,1	26	8,7	77	14,8	0,74
Type of partner							
Regular	155	60,1	265	72,4	349	67,2	
Occasional	103	39,9	101	27,6	170	32,8	0,31
Condom use							0,001**
Always	98	44,3	91	30,5	189	36,4	
Occasionally	108	48,9	196	65,8	304	58,6	
Never	15	6,8	11	3,7	26	5,0	
Type of condom utilize							-
Male	221	100,0	291	97,7	512	98,7	
Female	0	0,0	7	2,3	7	1,3	

The values represent the number and percentages (%) of students who protect themselves and those who adopt risky behaviours.
**:Difference statistically significant between the 2 sexes.

Regarding the type of condom use during sexual intercourse, it was observed that most men (95.4%) and females (98.5%) recruited in this study although aware of the existence of the female condom do not effectively make use of. Only 2.3% (7/298) of sexually active students said to have used a female condom during the previous three months. For the other students, preference is always given to the male condom, with respectively 100% and 97.7% of men and women who have affirmed to have made use. As such, it would be judicious to carry out further investigation among youths and to develop and implement new strategies especially for the acceptance of the female condom.

Serological tests

Table 3 presents the results of the seroprevalence of HIV, HBV and chlamydia among the students tested.

This table clearly illustrates that: 1.1% (7/624) of students tested show an HIV positive result, 2.8% (5/176) is carriers of hepatitis B and 2% (2/100) are carriers of chlamydia. Similar to the general population, the female sex remains the most affected by these sexually transmitted infections, which leads to use the term *feminization* of these STIs.

Table 3: Results of STI/HIV tests according to sex.

Variable	Male	Female	Total	p-value (α=0,05)
Positive Result	%	%	%	
HIV (N=624)	0,8 ; (2/258)	1,4 ; (5/366)	1,1 ; (7/624)	0,01**
HBV (N=176)	2,5 ; (2/80)	3,1 ; (3/96)	2,8 ; (5/176)	0,82
Chlamydia (N=100)	0,0 ; (0/44)	3,6 ; (2/56)	2 ; (2/100)	0,22

The values represent the percentages (%)of HIV, Hepatitis B Virus and chlamydia seroprevalences.
**: Difference statistically significant between the 2 sexes.

DISCUSSION

From the results of this investigation, it appears that all participants (100%) had been sensitized on HIV/AIDS; 62.5% and 52.2% on HBV and chlamydia respectively. This high proportion of sensitized individuals could be explained by the following reasons: non curable character of HIV infection, the flamed in the number of HIV cases following its discovery up to the 1990s where the peak and the incidence was registered and poor prognosis associated with this disease before the outcome of ART. [21-23]

Although chlamydia is the most common sexual transmitted bacterial infection worldwide, [24] only half of the respondents in this study admitted have been sensitized. Taking into account the various consequences of this disease despite the fact that it may be asymptomatic just like most STIs, policy makers and public health actors should develop and implement strategic and sensitization plans focused on information, education and communication for change in behavior. In addition, knowledge of serological status is a great asset in the fight against STIs/HIV/AIDS; we however note the low proportion of students aware of their HVB and Chlamydia (34% and 21.3%) status against 64.4% (HIV) who know their status. This difference is due to the fact that free screening campaigns for HIV/AIDS among students are much more frequent than those of the HVB and chlamydia which even when organized are not free of charge. Obviously, the onerous nature of these two tests is an obstacle for these students who mostly have limited financial means. Indeed, limited financial resources are often cited as the main reason for the lack of information on serological status among students. [24,25]

Studies have shown that viral hepatitis B and chlamydia are asymptomatic. [24,26] Similarly, of particular concern during this investigation is the finding that many students ignore the fact that one can be infected with HBV (68.4%) and chlamydia (63.4%) and show no symptoms. Furthermore, 17% of respondents are unaware that chlamydia can lead to sterility.

Studies have shown that generally no difference exist between the level of knowledge and risk behavior of students on STI/HIV/AIDS compared to the general population, even if this school attending individuals often believe the better equipped to face this disease and therefore adopt risk behaviors. [27] This could justify the percentages of students who had many sexual partners (14.8%) and casual sexual intercourse (32.8%) during the 3 months preceding the survey. The student population belongs to the age group known to be the most sexually active coupled to the greatest unemployment rate. These two factors may explain the multiple partners and casual sexual relationships of the study participants. [25,28]

Despite the fact that the condom is the most effective method of protection against STIs/HIV/AIDS, [24,29,30] only 36.4% of those interviewed admitted to have systematically made use during the three

months preceding our survey. This low rate of condom use would result from the lack of responsibility by the youth, who are passionate by the discovery of new experiences. Therefore, it is absolutely crucial that public health authorities and stakeholders multiply health campaigns to inform on the multiple benefits associated with systematic condom use during sex thus raising awareness among students. In addition, other prominent point is the low rate of female condom use as a means of protection (1.3% against 98.7% of users of the male condom). This shows the "female-linked" nature of these infections. An investigation with the aim of assessing the perceptions of students on the female condom may help for its better promotion. This could increase its acceptance and use rates among students.

Looking at the prevalence of HIV (1.1%), HVB (2.8%) and chlamydia (2%) within the student population of the University of Dschang, the results are rather low compared to national prevalences (HIV: 4.3%; HVB: $\geq$ 10%;Chlamydia:> 35%), the female sex being the most affected. Adoption of responsible sexual behavior by the latter, the female condom use and negotiation with partners to wear condoms constitute means can be used to reduce the prevalence of these diseases not only among women but also throughout the general population.

CONCLUSION AND RECOMMENDATIONS

Overall, the data from this survey reveal that the prevalence of HIV, HBV and Chlamydia are low among the students enrolled at the University of Dschang compared to values at national level. This is likely due to past sensitization campaigns carried on Campus. However, some risk behaviors such as: non-condom use and multiple sexual partnerships are potential sources of transmission of these infections.

Moreover, knowing that early detection of sexually transmitted infections is an effective way to fight against them, it is essential not only to conduct more sensitization campaigns on the HVB and Chlamydia, but also to subsidize their screening. Indeed, the screening cost for these diseases is so far a real obstacle to the knowledge of HIV status.

Conflicts Of Interest
The authors have no conflicts of interest to declare in relation to this study.

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