Original Research Article

Prevalence and associated factors of HIV infection among pregnant women attending antenatal care at the Yaoundé central hospital

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ABSTRACT

Background: HIV infection affects millions of people worldwide, especially in sub-Saharan Africa. Transmission occurs by several means including the transmission from mother to child. The objective of this study was to determine the prevalence and factors associated with HIV infection in women attending antenatal care at the Yaoundé Central Hospital.
Methods: We conducted an analytical cross-sectional study at the Obstetrics and Gynecologic Unit of the Yaoundé Central Hospital from 6th October 2015 to 30th June 2016. The sampling was consecutive. We included 360 pregnant women. Testing was done by a sensitive test and a specific test if the first was positive. Data analysis was done through Excel 2007 software EpiData Analysis Version 3.2 and STATA version 12.0 (Texas USA 2001). Statistical significance was accepted for a value of P <0.05.
Results: The average age of our population was 27.99±5.63 years, ranging from 15 and 47 years. HIV prevalence in this population was 13.1% (47/360). Factors associated with HIV were the primary level of study (OR=7.97; 95% CI=2.23 to 28.49, P=0.001) and multiple sexual partners (OR=4.82; CI 95%=2.24 to 10.38, P=0.002).
Conclusions: HIV prevalence in pregnant women at the Maternity of HCY is 13.1%. The low level of education and multiple sexual partners were significantly associated with HIV infection. We suggest the education of the girls who is a key factor in the empowerment of women.

Keywords: Antenatal care, HIV, Prevalence, Pregnancy, Yaoundé

INTRODUCTION

In 2013, an estimated 35 million people were living with HIV (Human Immune Deficiency Virus) worldwide, nearly three quarter of them in sub-Saharan Africa.[1] The prevalence of this infection varies from one continent to another and from one region to another within the same country. According to the latest demographic survey in 2011, the prevalence of HIV and AIDS (Acquired Immune deficiency syndrome) was 4.3% in the general population in Cameroon.[2]

In the population of pregnant women, the average prevalence of HIV in 10 sentinel sites in Cameroon was 7.8% in 2013. The risk of HIV transmission from mother to child is 30-45% in the absence of any intervention. The Prenatal care is often the only contact opportunity with a health facility, for screening this infection. The Knowledge of status of pregnant women could reduce the

risk of vertical transmission of HIV through the interventions of Prevention of mother to child.[3]

Our objective was to determine the prevalence and factors associated with HIV infection among pregnant women attending antenatal care (ANC) at the Yaoundé Central Hospital (YCH), and to identify factors associated with HIV infection in this population.

METHODS

We conducted an analytic cross-sectional study in the Obstetrics and Gynecology Unit of the Yaoundé Central Hospital over a period of 9 months, from 06th October 2015 to 30th June 2016. The study population consisted of pregnant women attending ANC at the HCY. Were included all pregnant woman who gave the consent to participate in the study. Sampling was consecutive and comprehensive. During our study period, we offered each woman who came for ANC to participate in the study by explaining the objectives of the study. After obtaining consent, an examination was done to each of them to fill the preset specifications seeking:

- Socio-demographic data: age, marital status, occupation, education, religion, region of origin, place of residence
- Obstetric data: pregnancy, parity, gestational age.
- The history: blood transfusions, dental, surgery, HIV into the family
- The risk behaviors: tattoos, piercings, multiple partners, intravenous drug use.

After a well conducted counseling a levy was made for serological analysis and serology results were also recorded on the data sheet.

Each study participant was included in a special register; a unique identification number was assigned to each. 3 ml of venous blood were taken aseptically using a 5ml syringe at the elbow crease then put in a dry tube previously identified. The samples were subsequently placed in tubes doors and left in ambient air for several hours to obtain serum.

We used strips (Alere Determine™ HIV-1/2) for rapid diagnosis: the search for the HIV antibody; this test has a sensitivity of 100% and a specificity for 99.89%. This is a quick immunochromatographic test for visual reading for the qualitative detection of anti-HIV antibodies 1 and 2. Serum deposited on the drop zone will migrate by capillary action taking with him the reagent already present on the membrane. Serum will meet the HIV antigen already present on the membrane to provide a visible color to the naked eye.

If the anti-HIV-1 and / or 2 are present, they will bind to the antigen of the conjugate selenium colloid-antigen and the antigen of the patient window by forming a red line.

If HIV antibodies are absent, the conjugate through the patient window without forming a red line.

Interpretation

- The test is positive when said two red bars appear in the patient and control zones of the strip,
- It is negative when no bar does not appear on the patient area of the strip but is present in the control area,
- The test is invalid if no red bar will appear on the 2 zones or if the bar appears only on the patient's area (Figure 1).
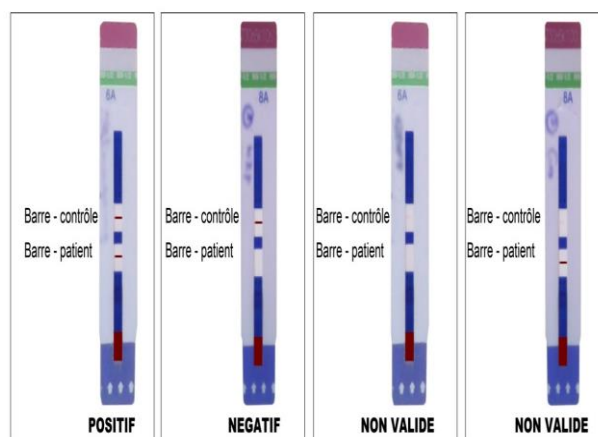
Figure 1: Possible results of the test by Alere determine ™ HIV-1/2.

For those reactive to HIV determines a second test was done using another TDR OraQuick (OraQuick ADVANCE ® Rapid HIV -1/2 Antibody Test).

The results were given to each participant after post-test counselling. A review report was presented for confirmation to the Centre Pasteur of Cameroon. The results of the tests made at Centre Pasteur of Cameroon were all consistent with ours. These reactive HIV were transferred to the hospital the day of HCY for Antiretroviral therapy for life. The non-reactive women were advised to do a control test after 3 months.

The data collected were compiled on pre-established forms. They were subsequently returned to a database built with Epidata Entry version 3.1software. Microsoft Excel 2007 software, Epidata analysis Version 3.2 and STATA version 12.0 Transfer were used for data analysis. The descriptive analysis was used to calculate the frequencies, means, medians and standard deviation. The statistical test of chi-2 and the Fisher's exact test were used to compare the frequencies with a threshold of significance $\alpha = 5\%$. The α error threshold was set at 5% as statistically significant for each variable studied. The association between risk factors and each infection was done with the report of coastline (or odds ratio) expressed with its 95% confidence interval. The study of the association was made by univariate analysis at first, then

logistic regression to eliminate confounding factors. Present project protocol was previously submitted to the Ethics Committee of the University of Douala / Faculty of Medicine and Pharmaceutical Sciences for obtaining ethical clearance allowing us to conduct our study that was made in strict compliance with ethics. We also received the authorization of research from the administration of Yaounde Central Hospital Women were clearly informed of the object of present study and their consent was obtained before inclusion in this study. The collected data served only for the study and the anonymity was preserved.

RESULTS

During the study period 1125 women came to ANC. We deleted 225 duplicates and 540 patients who did not give their consent to participate in the study. We finally analyzed a total 360 women.

Serologic prevalence of HIV

From 360 women, 47 had positive serology of HIV, given the prevalence of 13.1%.

Risk factors associated with HIV

Distribution of HIV seroprevalence according to sociodemographic characteristics.

Statistically significant differences between the 2 groups were observed in the age group of 30-34ans, levels of primary and secondary education and the student (Table 1).

Table 1: Distribution of HIV prevalence by socio-demographic characteristics.

Variables	Number N=360	HIV		OR (IC95%)	P-value
		Positive (%) 47 (13.1)	Negative (%) 313 (86.9)		
Age (years)					
15-19	12	0	12 (100)	NA	
20-24	96	5 (5.2)	91 (94.8)	1.93 (0.84-3.04)	0.06
25-29	119	12 (10.1)	107 (89.9)		
30-34	82	22 (26.8)	60 (73.2)	4,18 (4.7-6.21)	
35-39	41	6 (14.6)	35 (85.4)	2.14 (0.79-5.78)	<0.001
40+	10	2 (20.0)	8 (80.0)	1.47 (0.29-7.45)	
Marital Status					0.171
Married	246	35 (14.2)	211 (85,8)	1,41(0,70-2,83)	
Single	114	12 (10.5)	102 (89,5)		1.000
Level of education					0,401
Primaire	30	14 (46.7)	16 (55,3)	3,60 (1,57-8,24	0,0007
Secondaire	163	25 (15.3)	138 (84,7)	4,83 (2,10-11,12)	<0,01
Universitaire	167	8 (4.8)	159 (95,2)		
Profession					
Remunerated activity	148	21 (14.2)	127 (85,8)		
Student	145	6 (4.1)	139 (95,9)	3,83 (1,50-9,79)	<0,01
House wife	67	20 (29.9)	47 (70,1)	1,1 (0,19-1,78)	0,6
Region of origin					
West	145	12 (8.3)	133 (91,7)		
Centre	139	26 (18.7)	113 (81,3)	0,92(0,27-3,12)	0,58
Littoral	34	4 (11.8)	30 (88,2)	1,73 (0,56-5,33)	0,451
South-West	14	1 (7.1)	13 (92,9)	2,99 (0,37-23,90)	0,466
Nord	13	1 (7.7)	12 (92,3)	2,76 (0,34-22,19)	0,465
Est	11	3 (27.3)	8 (72,7)	1,02 (0,33-3,16)	0,96
Others	4	0	4 (100)	_	
Residency					
Urban	351	45 (12.8)	306 (87.2)	0,9 (0,10-2,56)	0,33
Rural	9	2 (22.2)	7 (77.8)		
Religion					
Christian	336	45 (13.4)	291 (86.6)		
Muslim	21	1 (4.8)	20 (95.2)	3,09 (0,41-23,61)	0,496
Other	3	1 (33.3)	2 (66.7)	0,31 (0,03-3,48)	0,355

Distribution of HIV seroprevalence based on obstetric characteristics: There is a statistically significant difference in the 2 groups for primigravida and pauciparous (Table 2). Association between risk behaviors and HIV. There is a statistically significant difference in 2 groups for tattoo and multiple sexual partners (Table 3).

Table 2: Distribution of HIV prevalence based on obstetric characteristics.

Variables	Number N=360	VIH		OR (IC95%)	P-value
		Positive (%) 47 (13,1%)	Negative (%) 313 (86,9%)		
Gravidity					
Primigravida	91	1 (1,1)	90 (98,9)	0,84 (0,79-0,89)	<0,0001
Multigravida	269	46 (17,1)	223 (82,9)		
Parity					
Nulliparous	117	5 (4,3)	112 (95,7)		
Primiparous	94	12 (12,8)	82 (87,2)	0,54 (0,25-1,16)	0,136
Pauciparous	108	23 (21,3)	85 (78,7)	3,1 (2,5-3,61)	0,002
Multiparous	25	5 (20)	20 (80)	1,08 (0,37-3,20)	1,000
Grand multiparous	16	2 (12,5)	14 (87,5)	1,89 (0,4-8,94)	0,523
Gestational age					
1st trimester	84	12 (14,3)	72 (85,7)	1,18 (0,54-2,58)	0,688
2nd trimester	131	17 (13,0)	114 (87,0)	1,1 (0,23-2,54)	0,48
3th trimester	145	18 (12,4)	127 (87,6)	1,05 (0,52-2,14)	1,000

Table 3: Risk behaviour and HIV infection among participants.

Variables	N=360	HIV+n= 47	HIV-n= 313	OR (IC95%)	P-value
Blood transfusion					
Yes	25	3 (12,0%)	22 (88,0%)	0,90 (0,26-3,14)	1,000
No	335	44 (13,1%)	291 (86,9%)		
Tattoo					
Yes	31	9 (29,0%)	22 (71,0%)	3,13 (1,34-7,30)	0,017
No	329	38 (11,6%)	291 (88,4%)		
Scarification					
Yes	107	18 (16,8%)	89 (83,2%)	1,56 (0,83-2,95)	0,174
No	253	29 (11,5%)	224 (88,5%)		
Piercing					
Yes	9	2 (22,2%)	7 (77,8%)	1,94 (0,39-9,65)	0,332
No	351	45 (12,8%)	306 (87,2%)		
Multiple sexual Partners					
Yes	36	13 (36,1%)	23 (63,9%)	4,82(2,24-10,38)	0,0002
No	324	34 (10,5%)	290 (89,5%)		
Dental care					
Yes	94	8 (8,5%)	86 (91,5%)	0,54 (0,24-1,21)	0,155
No	266	39 (14,7%)	227 (85,3%)		
Recent surgery					
Yes	47	5 (10,6%)	42 (89,4%)	0,77 (0,29-2,05)	0,816
No	313	42 (13,4%)	271 (86,6%)		
Family history of HIV					
Oui	34	13 (38,2%)	21 (61,8%)		
Non	203	20 (9,9%)	183 (90,1%)	NA	0,0001
Non précisé	123	14 (11,4%)	109 (88,6%)		

Logistics regression

After logistic regression, the level of primary instruction and multiple sexual partners are factors associated with HIV infection in pregnant women (Table 4).

Table 4: Logistic regression of HIV correlate factors.

Variables	OR	IC95%	P-value
Primary level	7,97	2,23-28,49	0,001
Multiple sexual partners	4,79	1,79-12,79	0,002

DISCUSSION

Prevalence of HIV infection

The prevalence of HIV infection in pregnant women was 13.1% in the maternity of the Yaoundé Central Hospital. This result was far superior to that found by Billong et al in 2012 (7.8%) during their study in 10 sentinel sites in Cameroon, also some studies in some African countries including the Democratic Republic of Congo 2013 (4.3%) and (6.6%) in 2014 in Ethiopia.[4-6]

The superiority of our results compares to Billong and al can be explained by the fact that we recruited not only pregnant women attending health facility while Billong et al did a community based study.[4]

This high prevalence can also be explained by the fact that the maternity of YCH is a reference centre in the Yaounde town for the prevention of mother to child transmission where we can found well trained staff.

Our result is similar to the foundings of Fouedjo et al who reported in 2012, a prevalence of 11.26% among women who delivered in YCH.[7] This result is closed to that of Kasenga et al that in 2009 in a rural area of Malawi found themselves an HIV prevalence of 15.6% in pregnant women.[8]

Factors associated with HIV

Concerning age, the age group of 25-34 years was significantly associated with HIV. Okerentugba et al in 2015 in Nigeria had found that age is associated with HIV in pregnant women.[9] This same age group 25-34 years was also found to be associated with HIV in a study in 2011 in Tanzania.[10]

The high prevalence of HIV in this age there can be explained by the fact that at this age women are sexually very active and therefore very vulnerable to HIV.

According to the education level, the primary level was statistically associated with HIV even after multivariate analysis. Billong et al also found a high prevalence of HIV in this group during their sentinel study in Cameroon in 2012.[4] This result is similar to the latest EDS-MICS 2011 of Cameroon who found a higher prevalence HIV among women with a primary level of study.[2] Another sentinel study in Haiti in 2007 found the same result.[11]

This could be explained by the fact the level of education is correlated to the understanding the health education messages issues on advantages of good behaviors and behavior changes. Concerning occupation, HIV-infected women in this study were mostly housewives. Billong et al found in their study that women with low incomes were most affected with HIV.[4] In 2008, a study in Mali reported the same result.[12]

According to obstetric characteristics, pauciparity was significantly associated with HIV. While the primigravida and nulliparity were protective factors.

We could not find any information in the literature on the influence of gender and pregnancy on the incidence of HIV. Nevertheless, we can explain this result by the fact that high parity stems from multigravida and being multigravida proves a multiplicity of unprotected sex that increase the risk of becoming infected with HIV. The analysis of risk behavior demonstrated that multiple sexual partners and tattoos were associated with HIV. Bankole also found that these factors are associated with HIV in Nigeria in 2012.[13]

Limitations of this study was conducted in health facility, the Maternity; therefore, the results cannot be generalized because the arised from hospital based data.

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