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Clinical, Biological and Sociodemographic Profiles of Highly Active Anti-Retroviral Therapy (HAART) Naïve Patients in the Garoua Military Hospital, Cameroon

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Abstract: Knowing at what point patients are put on treatment during the clinical and biological (CD4 count) stages of HIV is important. This study investigated the clinical, biological and sociodemographic profiles of highly active antiretroviral therapy (HAART) naïve patients in the Garoua military hospital, Cameroon. This was a cross-sectional study that collected data on demographic, clinical and laboratory variables from 66HIV-infected patients aged 19 years and older from January 2013 to January 2014. Data were analysed using the Statistical Package for Social Sciences (SPSS) version 20 software program at the level 0.05. Sixty-six (66) HIV positive patients were received in the health facility during the study period, the majority of whom were female, 65.6%. Only 37.5% of their sexual partners were aware of patients' HIV serostatus. Similarly, only 26.8% of patients' stable sexual partners had done an HIV test, of which 73.3% tested positive. Skin diseases, weight loss and chronic fever were the commonest clinical manifestations found (33.3%, 25.4% and 17.5% respectively). About 90% of the clients had CD4 counts less than 350 cells/mm3 on clinical presentation. Hemoglobin counts less than 12g/dl were found in 72.7% of the clients. Females were more likely than males to present with skin diseases, weight loss and fever. However, the differences were not statistically significant (p=0.159). Similarly, females (65.0%) were more likely to have CD4 counts less than 350 compared to males (35.0%) (p=0.167). More patients age less than 35 years, presented with skin diseases, weight loss and cough than those age more than 35 years. However, these differences were not statistically significant (p=0.632). In the same vein, more patients, age less than 35, had CD4 counts less than 350, than those aged more than 35 years (p=0.430). Most of our study patients had CD4 counts less than 350 cells/ml at presentation for HAART initiation. This suggests late HIV diagnosis and thus a delayed opportunity for timely access to HIV care and initiation of HAART. There is the need to intensify efforts in early routine HIV counseling and testing in health facilities in the cities, smaller towns and rural communities, so as to reduce the frequency of late HIV diagnosis with its potential implications. Encouraging clients to get their partners tested and consequently be managed appropriately is of utmost need in this area. Qualitative research to better ascertain reasons of not knowing partner status should be carried out.

Keywords: HAART Initiation, HIV Naïve Patients, Clinical and Biological Profile, Garoua, Cameroon

1. Introduction

Efforts to scale up access to HIV care and treatment have been successful at initiating large numbers of patients on antiretroviral therapy (ART). Sub-Saharan Africa is the most affected region, constituting 69% of people living with HIV/AIDS (PLWHIV) and 70% of HIV/AIDS deaths worldwide [1]. The estimated number of people on ART in the region increased from 100,000 people in 2003 to 8 million by the end of 2011, reaching an estimated 44% of those in need [1]. The introduction of highly active antiretroviral therapy (HAART) in 1996 has been associated with a remarkable

decrease in AIDS-related mortality, which has changed the perspective of HIV infection from that of a rapid fatal to a chronic manageable infection [2]. Clinical benefits of HAART are due to its effectiveness in decreasing disease progression in HIV infected patients by sustained suppression of viral replication [3]. These successes, coupled with the availability of free drugs and an increase in donor funding has led many countries including Cameroon to implement and scale up HIV treatment programs for its HIV positive citizens. Despite these successes, there remain persistent challenges to optimizing the effectiveness of HIV care and treatment scale-up in the region. Among the most important of these are very high rates of late ART initiation (in the advanced stages of HIV disease) [4], which in turn drive high rates of mortality soon after initiation of ART (early mortality) [5]. Late ART initiation is also associated with a longer infectious period, and earlier ART initiation substantially reduces onward HIV transmission [6].

To achieve this, optimal patient adherence to HAART is necessary. Levels of adherence in excess of 95% are required to ensure treatment success, adequate viral load suppression, improved immune status and slowing of the disease progression [7].

Timely initiation of HAART remains a key determinant in reducing HIV associated morbidity, mortality and transmission [8]. Perfura Yone et al, report high non-adherence rates between 22 to 35% amongst 899 adult clients on HAART in Yaounde, Cameroon [9]. Timely initiation of HAART is also associated with fewer drug side effects and consequently lower non-compliance rates [8, 10]. In Malawi, 68.7% of eligible HIV infected clients, based on both the clinical and biological criteria, started their treatment on time [10]. Uptake and timing of HAART initiation does differ amongst men and women. In rural South Africa, the uptake among HIV positive men is slightly lower than among women [11, 12]. In Northern Nigeria, males were found to be more adherent to HAART than females [13]. HIV infection is one of the major causes of depletion in CD4+ cells and CD4 count is one of the parameters used to measure disease progression in HIV-positive persons. Levels of CD4 count have been used for immunological classification of HIV infection and these levels have been shown to correlate with clinical staging of HIV-related diseases. Therefore, low CD4 counts at treatment initiation are associated with poorer outcomes [1, 12, 14].

As in other African countries, the prevalence of HIV in Cameroon has risen dramatically from 0.5% in the early 1990s to 4.3% in 2014. The prevalence in the North Region, where Garoua, the study site is located is 2.4 % [15]. In Cameroon as elsewhere, numerous health education and promotion interventions have been put in place and implemented over the years by government, international donors and NGOs, to facilitate early diagnosis and placement of eligible HIV positive clients on HAART. Disclosure of HIV serostatus remains an important tool for the prevention of new infections and early initiation of treatment for HIV-positive individuals' regular sexual partners. In West Africa, disclosure to partner is lower (72.1%) in men compared to women. (79.9%) [16].

Garoua is the administrative headquarters of the North Region of Cameroon. Studies from this region of the country reporting on the timing of HAART initiation are rare. Knowing at what point patients are put on treatment during the clinical and biological (CD4 count) stages of HIV is important. The purpose of this study was to identify the clinical and biological status of our clients before placement on Highly Active Anti-Retroviral Therapy (HAART). We aimed at investigating the magnitude of late HAART initiation problem in Garoua, including precursors of late HAART initiation (late HIV diagnosis and late enrollment into HIV care).

2. Methods

2.1. Study Site

Garoua is the administrative headquarters of the North Region of Cameroon. The Garoua Military hospital is the second most visited health facility in this urban setting, and manages over 300 patients at the moment in its HIV-AIDS care unit. It receives both military and civilian clients, with civilians constituting over 70% of the patients received. This city is having a population of approximately 437,000 inhabitants. The current prevalence of HIV in the north region of Cameroon was reported as 2.4% [15].

2.2. Study Design and Population

This was a cross-sectional study on all adults (over 18 years) HIV positive and HAART naïve patients in the Garoua Military Hospital HIV/AIDS care service, received between January 2013 and January 2014 (12 months). Exclusion criteria were age less than 18 years, prior HAART and poor health status, with the patient unable to give consent and respond to the initial inclusion questionnaire. Data on 66 consecutive patients were analyzed. We used data that were already being captured in an electronic data management system at the HIV clinic. Approval to use the data of these HAART naïve patients was obtained from the administrative authorities of the Garoua military hospital.

2.3. Case Definitions

Patients were considered eligible for treatment if their CD4+ counts were less than 350/mm3 or were presenting with an AIDS-defining illness according to the World Health Organization (WHO) criteria [17]. The therapeutic committee determined the eligibility for HAART based on the WHO criteria.

2.4. Data Collection

Socio-demographic characteristics including mainly the age, sex, marital status, knowledge of stable partner's HIV status, were collected using a semi-structured questionnaire. The baseline hemoglobin levels and CD4 counts were extracted from their pretreatment work up result sheets. Main clinical findings during this pre-placement on treatment visit were also recorded. These were mainly: long lasting fever for over a

month, cough, diarrhea, weight loss and skin diseases. The patients underwent a proper clinical review and the decision to be placed on treatment was mainly a CD4 count of less than 350 cells/mm3 or WHO stage III [17].

2.5. Data Analysis

After transcribing and cleaning, data were analyzed using Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) 20.0 software for Windows. Data were summarized by means of descriptive statistics, including the frequency table. The Chi-square test was used to compare observed differences in proportions. The level of significance was set at 0.05 (α = 5%).

3. Results

3.1. Descriptive Statistics

Table 1. *Descriptive statistics.*

Characteristics	Frequency	Percentage
Age group (n=66)		
Less than 35	37	56.1
35 or more	29	43.9
Marital status (n=60)		
Married	28	46.7
Single	15	25.0
Divorced	17	28.3
Sex (n=64)		
Male	22	34.4
Female	42	65.6
Is your sexual partner aware of your status? (n=56)		
Yes	21	37.5
No	35	62.5
Has partner been tested before? (n=56)		
Yes	15	26.8
No	41	73.2
Result of tested partner (n=15)		
Positive	11	73.3
Negative	4	26.7
Symptoms of medical history (n=63)		
Fever	11	17.5
Cough	6	9.5
Weight loss	16	25.4
Chronic diarrhea	4	6.3
Skin disease	21	33.3
Others (unspecified)	5	7.9
CD4 lymphocyte count (n=65)		
Less than 350	59	90.8
350 or more	6	9.2
Hemoglobin level (g/dl): (n=66)		
Less than 8	9	13.6
8-11.9	39	59.1
12 or more	18	27.3

Sixty-six (66) HIV positive patients were received for prenatal care consultations, deliveries, general consultations and hospitalization in the health facility during the study period. The clients were aged between 19 and 55 years, with a mean (SD) age of 34.7 (9.55) years. Most of them (65.6%) were females and 46.7% were married. Only 37.5% of their sexual partners were aware of patients' HIV serostatus. Disclosure rates between males and females were not compared; however, from general practice and experience, disclosure is higher in females compared to males. Only, 26.8% of patients' stable sexual partners had done an HIV test, of which 73.3% tested positive. Skin diseases, weight loss and chronic fever were the commonest clinical manifestations found (33.3%, 25.4% and 17.5% respectively). About 90% of the clients had CD4 counts less than 350 cells/mm3 on clinical presentation. Hemoglobin counts less than 12g/dl were found in 72.7 % of the clients (13.6% of clients had hemoglobin counts less than 8g/dl, and 59.1% had Hemoglobin counts of between 8 and 11.9g/dl) (Table 1).

3.2. Associations Between Gender, Symptoms of Medical History and CD4 Count

Two out of the five clients with CD4 counts more than 350 (40%) met the WHO clinical criteria to be placed on treatment. Over 95% of the patients received at the centre within this period were eligible for HAART, clinically or immunologically, according to WHO classification [17]. Females were more likely than males to present with skin diseases, weight loss and fever. However, the differences were not statistically significant (p=0.159). Also, females (65.0%) were more likely to have CD4 counts less than 350 compared to males (35.0%). This difference however, was not statistically significant (p=0.167) (Table 2).

Table 2. *Associations between gender, symptoms of medical history and CD4 count.*

Characteristics	Sex n (%)		P value
Symptoms of medical history (n=61)	Male	Female	
Fever (n=11)	4 (36.4%)	7 (63.6%)	X^2=26.219
Cough (n=6)	2 (33.3%)	4 (66.7%)	df=20
Weight loss (n=16)	6 (37.5%)	10 (62.5%)	P=0.159
Chronic diarrhea (n=3)	3 (100%)	0 (0.0%)	
Skin disease (n=20)	7 (35.0%)	13 (65.0%)	
Others (unspecified) (n=5)	0 (0.0%)	5 (100%)	
CD4 lymphocyte count (n=65)	Male	Female	
Less than 350 (n=60)	21 (35.0%)	39 (65.0%)	X^2=256.88
350 or more (n=5)	2 (40.0%)	3 (60.0%)	df=236 P=0.167

3.3. Associations Between Age, Symptoms of Medical History and CD4 Count

More patients age less than 35 years, presented with skin diseases, weight loss and cough than those age more than 35 years. However, these differences were not statistically significant (p=0.632). In the same vein, more patients, age less than 35 years, had CD4 counts less than 350, than those aged more than 35 years (p=0.430) (Table 3).

Table 3. *Associations between age, symptoms of medical history and CD4 count.*

Characteristics	Age n (%)		P value
Symptoms of medical history (n=61)	Less than 35	35 or more	
Fever (n=11)	3 (27.3%)	8 (72.7%)	X^2=143.596
Cough (n=6)	4 (66.7%)	2 (33.3%)	df=150
Weight loss (n=16)	9 (56.3%)	7 (43.7%)	P=0.632
Chronic diarrhea (n=3)	2 (66.7%)	1 (33.3%)	
Skin disease (n=20)	13 (65.0%)	7 (35.0%)	
Others (unspecified) (n=5)	2 (40.0%)	3 (60.0%)	
CD4 lymphocyte count (n=65)	Less than 35	35 or more	
Less than 350 (n=59)	50 (84.7%)	9 (15.3%)	X^2=1838.958
350 or more (n=6)	3 (50.0%)	3 (50.0%)	df=1829
			P=0.430

4. Discussion

This study had as main objective, to describe the clinical, biological and sociodemographic characteristics of HAART naïve patients before placement on treatment in the Garoua military hospital, Cameroon. The mean age of the patients was 34.7 years, which conforms to the sexually active group as indicated by UNAIDS (18). We also observed female predominance (65.6%%; male/female ratio of 1/2), which is similar to that obtained in South Africa [11, 12, 19] and Burkina Faso [20].

Knowledge of patients on their sexual partner's serostatus was very low (37.5 %). This is a serious risk with regard to continual spread of HIV and other Sexually Transmitted Infections in this area of Cameroon. Clients presented at the treatment centre late (90% of them had CD4 counts less than 350 cells/ml). This could be due to lack or weakness of VCT centres (including PMTCT facilities) in the northern region of Cameroon, and the fact that HIV screening is not being performed at the level of health centres, or the referral system from the health centres to the VCT centres are not performing at optimal capacity. This could lead to poorer outcomes when patients are put on treatment late [9,11]. It has been shown that HIV positive persons presenting late (late presenters) are often diagnosed with late HIV disease which corresponds to severe immune suppression, defined as CD4 count less than 200 cells/ml [21,22]. Those with a low CD4 count at baseline besides having a higher risk of clinical events [23], are less likely to have a sustained virological response when placed on HAART compared to those commencing treatment at higher counts [24].

Anaemia has been described to be associated to poorer outcomes during the course of HIV disease (8). In our sample, 72.7 % of our patients had hemoglobin counts less than 12g/dl. Being a malaria endemic area, low hemoglobin levels could be partly explained by Plasmodium infestation.

In accordance with other studies, [25, 26] females and younger patients were more likely to present with advanced disease than males and also had lower CD4 counts at presentation than males, though the results were not statistically significant. The burden of HIV worldwide is higher amongst females than males [1]. The social and biological susceptibility of females compared to males with regard to contracting HIV is known [2]. Though results were not statistically significant, it might be of interest to consider females as a priority in this area with regard to screening and prevention interventions.

This study points squarely to late HAART initiation among HIV-positive patients in the Garoua military hospital, Cameroon. This could be a major contributor to the problem of early mortality and morbidity following HAART initiation in sub-Saharan Africa, which could threaten to substantially limit the effectiveness of HIV care and treatment scale-up in the region, including its direct effect on individuals with HIV [27] and its indirect effect on HIV incidence [6]. However, during the period of this study, we did not data on the mortality rate among the cohort of patients followed in the study area.

The following strategies could potentially contribute to reducing late HAART initiation in the north region of Cameroon:

- Promoting early HIV diagnosis by expanding provider-initiated counseling and testing; enhancing MTCT services; offering mobile, home-based or work-based services for HIV counseling and testing; implementing partner-testing services as well as active-testing approaches; increasing HIV/AIDS knowledge to reduce community stigma, and advertising ART availability to contribute to further expansion of testing.
- Improving linkage to care for timely enrollment into care by optimizing and simplifying the referral process across services (e.g., reducing the number of return visits newly-diagnosed people need to make before becoming enrolled in a care and treatment site); providing peer supporters to escort and provide emotional support to newly-diagnosed individuals through the linkage-to-care process; and using SMS or other reminder systems to follow-up individuals who test positive but are not known to have not enrolled in HIV care within 30 days.
- Reducing late HAART initiation by implementing point-of-care CD4 testing to allow for faster determination of HAART eligibility; increasing retention of pre-HAART patients by improving support services such as peer educator programs, nutritional support, and transport assistance; shortening programmatic delay from CD4 testing to HAART initiation (e.g., by streamlining clinical and non-clinical aspects of the eligibility determination process)
- Operations research, by using a systematic approach to track and detect bottlenecks in the HIV care process from HIV diagnosis to treatment and follow-up; investigating upstream determinants beyond the individual-level; capitalizing on significant existing aggregate-level data collected as part of routinely service delivery or ministry/donor reporting as well as DHS data to generate hypotheses regarding the association between promising program and contextual level factors and early diagnosis, enrollment into care and HAART initiation; and collecting data to examine the influence of promising

clinic/program-level factors that are already being used or will soon be rolled out by many clinics (e.g., outreach or point of care CD4 testing) to assess their relationship to the outcomes of CD4 at enrollment to care and CD4 count at HAART initiation at the individual and aggregate levels.

Given that hundreds of thousands of Cameroonians will be initiating HAART in the coming decades, the number of lives potentially saved, directly and indirectly, by reducing late ART initiation would be substantial over the long term.

5. Conclusion

Majority of the patients (about 90%) had CD4 counts less than 350 cells/ml before being put on HAART. Most clients are unaware of the HIV serostatus of their sexual partners. These patients thus have a delayed opportunity for timely access to HIV care and initiation of HAART due to late presentation. There is therefore the need to intensify the present efforts on early routine HIV counselling and testing not only in well-established donor-supported facilities in the cities, but also in smaller towns and rural communities, so as to reduce the frequency of late HIV diagnosis and its potential implications. This study therefore provides further insight helpful in designing and implementing evidence-based interventions in regional as well as national programs by policy makers and any governmental or non-governmental organizations working with PLWHIV in creating conducive environments for timely initiation of HAART.

Limitations

The study duration was short. More conclusive results would have been obtained if carried out for a longer period. This was a single centre study; including other treatment centres in Garoua would have provided a broader picture. However, most HIV positive patients prefer the Garoua military hospital for care.

Authors' Contributions

This work was carried out in collaboration between both authors. LEB designed the study, managed the literature searches, and wrote the protocol and the first draft of the manuscript. EET performed the statistical analysis, performed further literature search, reviewed and revised the manuscript.SG and AJB critically reviewed the manuscript. All the authors read and approved the final manuscript.

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