



Causes of Hospitalizations in Adolescents Infected with HIV and on ARV Treatment in a Pediatric Ward in Ouagadougou

Yonaba Okengo C^{1*}, Kalmogho Zan Angèle¹, Toguyeni Tamini F², Sawadogo A¹, Zoungrana C¹, Ouédraogo F¹, Ouédraogo S², Dao L², Kyelem J¹, Koueta F¹, Yé D², Okeng'O K¹

¹Department of Pediatrics, CHU Yalgado Ouédraogo Ouagadougou, Burkina Faso; ²Department of Medical Paediatrics, CHU Paediatrics Charles de Gaulle, Ouagadougou, Burkina Faso

ABSTRACT

Introduction: Morbidity and mortality of adolescents infected with HIV are the highest among all age groups in Africa. In Burkina Faso, the situation of adolescents infected with HIV is not sufficiently documented, hence so many obstacles in advocacy for the improvement of their condition.

Objective: Analyze causes of hospitalization among adolescents on ART in the pediatric department of CHU Yalgado Ouédraogo (CHU YO).

Methodology: A retrospective study was done on adolescents infected with HIV, hospitalized in the department of Child Health at the Yalgado Ouédraogo University Hospital in Ouagadougou, Burkina Faso from January 2008 to December 2018. Causes of morbidity and mortality were then determined.

Results: A total of 158 adolescents were included, among them 15 (9.5%) had a history of hospitalization at least once. The most represented age group was 10 to 13 years. The sex ratio was 1.1. At the time of enrollment, the mean age was 4.9 years, acute malnutrition was 24%, and WHO clinical stage 3 or 4 was 48%. During hospitalization, the disclosure of the disease was effective in two patients. The most common cause of hospitalization was acute gastroenteritis. Factors associated with hospitalization were poor adherence to ARV treatment and severe acute malnutrition.

Conclusion: Reducing hospitalizations in HIV infected adolescents will require innovative strategies so as to maintain optimal ARV treatment adherence.

Keywords: Adolescents; VIH; ARV; Hospitalization; Ouagadougou

INTRODUCTION

Annual deaths related to HIV infection have decreased for all age groups except for adolescents (10 to 19 years) for whom mortality has more than doubled in recent years [1]. In 2016, West and Central Africa regions recorded a 15% increase in the annual number of HIV-related deaths in adolescents despite globally progress in the fight against this pandemic [2,3]. Moreover, in countries like Burkina Faso, the situation of ALHIV is not well known. What more, data by age groups rarely individualize adolescents as a group, in spite of the well-known

fact that this period of life can be very difficult especially for those living with HIV. Hence, adherence to Antiretroviral Treatment (ART) is in most cases a challenge, this contributes to the delay in attaining UN AIDS objective i.e., 95% of people on ARVs should have an undetectable viral load by 2030 [4-6]. In addition, ARV treatment has been associated with high prevalence of non-communicable diseases such as arterial hypertension, type 2 diabetes, kidney and liver diseases in the long term [7-11].

Correspondence to: Yonaba Okengo C, Department of Pediatrics, CHU Yalgado Ouédraogo Ouagadougou, Burkina Faso, E-mail: caroyonaba@yahoo.fr

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The objective of our study was to analyze causes of morbidity among adolescents on ART hospitalized in the pediatric department of CHU Yalgado Ouédraogo (CHU YO).

METHODOLOGY

This was a descriptive and analytical retrospective study on adolescents aged 10 to 19 years on antiretroviral treatment for at least 6 months, followed in the pediatric department of the CHU Yalgado Ouédraogo from January 2008 to December 2018. CHU Yalgado Ouédraogo is one of the main referral hospitals in the country for the care of HIV infected children and adolescents.

We used medical records as well as consultation and hospitalization registers. For each adolescent were included data upon study inclusion and hospitalization as follows: Socio-demographic (age, sex, location, schooling, and social status of parents), clinical characteristics (date of HIV diagnosis, circumstances of diagnosis, medical and surgical history, WHO clinical stage, anthropometric parameters and indices, etc), biological data (hemoglobin level, TCD4 lymphocyte level, viral load). Anemia was considered if the hemoglobin level was less or equal to 10 g/dl.

Data were analyzed using the EPI INFO software version 7.2.1.0. For the comparison of qualitative variables, we used Chi-square and Fischer's exact tests when sample was less than five (significance threshold $p \leq 0.05$). Variables with a p -value < 0.20 were introduced in a logistic regression model for the multivariate analysis.

RESULTS

Sample description

We included 158 adolescents, among them 15 (9.2%) had been hospitalized at least once since the diagnosis of HIV. The mean age at the time of diagnosis of HIV was 4.9 years [extremes 2 months and 14 years]. The mean age at enrollment was 13.6 years [extremes 10 and 19 years] with 82 (51.9%) adolescents less than 13 years old, and 15.2% over 17 years old. The sex ratio was 1.1. Adolescents were orphan of at least one parent in 29.8% of cases. HIV transmission was perinatally in 96.2%. Substantial academic difficulties were noted in 19 (31.2%) of the 141 adolescents attending school.

ARV treatment was initiated during adolescence in 19.6%. History of pulmonary tuberculosis was noted in nine adolescents. HbS antigen was positive in two adolescents and severe immunosuppression was observed in 77 (48.8%). Other main characteristics of the population are shown in Table 1.

Variable	n (%)
Age at diagnosis (years) n=158	
<10	127(80,4)
≥ 10	31(19,6)

Nutritional status at admission n=153	
Normal	65(42,5)
Moderate acute malnutrition	49(32)
Severe acute malnutrition	38(24,8)
Overweight	1(0,7)
Circumstances of HIV diagnosis n=138	
Clinical symptoms	112(81)
Routine screening	27(19,6)
Hemoglobin (g/dl) n=156	
<6	11(7)
06-Nov	138(88,5)
≥ 11	7(4,5)
LCD4 (µl/ml) n=148	
<200	36(24,3)
200-350	22(14,9)
350-500	14(9,4)
≥ 500	76(51,4)

Table 1: Characteristics of ALHIV on ARV in CHUYO from 2008-2018.

Causes of hospitalization and associated factors in ALHIV

Fifteen teenagers had a history of at least one hospitalization. The mean duration of hospital stay was 12.3 days [extreme 4 and 32 days]. Two adolescents aged between 17 and 19 were informed of their HIV positive status. The nutritional status was specified in 14 adolescents. Among them 9/14 had severe acute malnutrition and 2/14 had moderate acute malnutrition. Anemia was present in 14/15. LTCD4 and viral load rates were available in respectively 11 and 9 patients: LTCD4 rate ≤ 200 cells/ml in seven and Viral load ≥ 1000 copies/ml in six adolescents. Table 2 summarizes the reasons for hospitalization and final diagnostic during hospitalization.

Variable	Effect if
Causes of hospitalization	
Cachexia	10
Fever	9
Digest if symptoms	9

Respiratory disorders	5
Neurological disorders	8
Skin Abscess	2
Diagnostics	
Gastroenteritis/enteritis	6
Pulmonary Tuberculosis	2
Infectious Encephalitis	1
Toxic Hepatitis	1
Retinoblastoma	1
Severe Malaria	1
Bacteria pneumonia	1
Sepsis	1

Table 2: Causes of hospitalization and diagnostics in fifteen HIV infected adolescents hospitalized from January 2008 to December 2018 at CHUYO.

In multivariate analysis, optimal treatment adherence (OR=0.06 [0.007;0.57]; $p=0.005$) and WHO clinical stage 3 to 4 (OR=26.7 [4.97;143.27]; $p<0.001$) were significantly associated with morbidity.

DISCUSSION

Sample characteristics

The majority of ALHIV live in constraints conditions, thus one in three has learning problems at school (31.2%) and a third are (29.8%) orphans. The diagnosis of HIV infection in this population was quite late (4.9 years), this is still the case in most of sub-Sahara Africa [12] where HIV screening in children remains very low [13].

The impact of early ART initiation in reducing morbidity and mortality is well known [14-16]. However, little has been written about long-term effects of co-morbidities such as severe acute malnutrition [17]. For some authors, acute malnutrition at early age can reduce very significantly the chances for growth and immunity restauration, due to increased microbial translocation and systemic activation of altered LTCD4 [18,19].

Causes of hospitalization and associates factors

Hospitalization concerned 15 ALHIV. In South Africa, a multicenter study noted higher hospitalization incidence in HIV positive adolescents [OR 6.6 (95% CI:5.7-7.8)] compared to HIV negative [OR=2.2; 95% CI:1.2-4.3] with ($p<0.01$) [20]. Lower hospitalization incidence rate in our study is likely due to the small sample size and the fact that our unity wasn't admitting patients with surgical and mental health issues. Causes of

hospitalization were dominated by infectious diseases (79.7% of hospitalizations), unlike Frigat's study in which non-infectious diseases (90/515 cases) dominated hence hearing disorders (28%) and surgical pathologies (19%) [20]. In addition for Frigat, tuberculosis concerned 41.7% of infection cases while it concerned a much smaller population in our study. This could be because in Burkina Faso tuberculosis in adolescents is still largely underdiagnosed, and the population of HIV infected adolescents is small compared to that of South Africa, one of the most affected countries in Africa [20]. The key to reducing tuberculosis-related mortality among ALHIV remains prevention through early diagnosis, improved hygiene, vaccination and prophylaxis [21,22].

Worldwide, highly effective ARV treatment and cotrimoxazole prophylaxis have reduced tremendously the incidence of other infections such as infectious gastroenteritis. However for patients experiencing ARV treatment failure (7/11 of our hospitalized patients), gastroenteritis especially of parasite origin remain life threatening in severe immunosuppression condition. As for non-infectious gastroenteritis, they are often underdiagnosed in resource limited setting and are most likely due to drug toxicity.

Two factors were significantly associated with hospitalization in ALHIV, namely poor ARV treatment adherence and severe acute malnutrition. Severe acute malnutrition in ALVIH with persistent ARV treatment failure is of poor prognosis and as such must be managed accordingly.

CONCLUSION

The limitations of this study are related to its retrospective nature and the small sample size. Thus, we could not compare our patients with a control group of HIV-uninfected adolescents. Furthermore, the scale of non-communicable diseases seemingly alarming in the region could not be assessed.

Causes of hospitalization among ALHIV are preventable. There is an urgent need for more reliable diagnosis tests for those diseases which contribute largely to high morbidity and mortality rate in ALHIV. Maintaining optimum ARV treatment adherence remains a challenge in ALHIV.

CONFLICT OF INTEREST

None

ETHICAL STANDARDS

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national guidelines and has been approved by the Ethics Committee of CHU Yalgado Ouédraogo.

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