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FACTORS ASSOCIATED WITH GOOD THERAPEUTIC ADHERENCE AMONG CHILDREN UNDER 15 LIVING WITH HIV AT THE MOTHER AND CHILD UNIVERSITY HOSPITAL OF N'DJAMENA

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ABSTRACT

Introduction: Therapeutic adherence is a key determinant of the effectiveness of antiretroviral (ARV) treatment in children living with the human immunodeficiency virus (HIV). The aim of this study was to identify the factors associated with good adherence in order to guide interventions to improve pediatric management. **Patients and Methods:** This was a cross-sectional study conducted from December 5, 2023, to May 30, 2024, in the Department of Pediatrics of the Mother and Child University Hospital of N'Djamena. Children under 15 years of age living with HIV and on ARV therapy for at least six months were included. Adherence was assessed using a composite score combining self-reporting, pill count, and regularity of visits. Associated factors were analyzed using multivariate logistic regression. **Results:** A total of 210 children were included. The overall rate of good adherence (≥95%) was 72.4%. Factors associated with good adherence included a tutor's secondary or higher education level (OR=2.1; p=0.03), parental support (OR=3.2; p=0.001), disclosure of HIV status to the child (OR=2.3; p=0.01), a simple therapeutic regimen (once-daily dosing) (OR=2.9; p=0.002), and regular follow-up visits (OR=3.8; p<0.001). **Conclusion:** Family involvement, therapeutic education, simplified regimens, and regular medical follow-up are major determinants of adherence. Strengthening these interventions could improve survival and quality of life among children living with HIV.

KEYWORDS: Therapeutic adherence – Associated factors – HIV-infected children – Mother and Child University Hospital.

INTRODUCTION

The human immunodeficiency virus (HIV) remains a major public health issue worldwide. According to the most recent UNAIDS data, in 2023, approximately 1.4 million children aged 0–14 years were living with HIV, and nearly 120,000 new infections were recorded during the year. However, only 57% of HIV-positive children had access to antiretroviral therapy (ART).[1] In West and Central Africa — a region particularly affected — nearly 48,000 new pediatric infections were reported in 2023.[1] These figures reflect not only the magnitude of the epidemic but also the persistent inequalities in access to care, often exacerbated by stigma and discrimination.

ART is one of the most effective interventions for reducing mortality and improving the quality of life of children living with HIV. Although it does not eradicate the virus, it transforms HIV infection into a chronic disease, provided that treatment is administered regularly and consistently.[2] However, the effectiveness of ART

essentially depends on a high level of therapeutic adherence, generally estimated at over 95%, in order to prevent virological failure and the emergence of drug resistance.[3]

In children, adherence to ART is particularly complex. It depends on numerous factors such as pill burden, the unpleasant taste of certain formulations, galenic inadequacies, the child's level of understanding, as well as the availability and involvement of parents or guardians.[4] Several methods have been proposed to assess adherence (pill count, self-reporting, electronic monitoring), but none has been universally recognized as a gold standard.[5]

In this context, it is essential to identify, at the local level, the determinants of good adherence in order to adapt interventions to the specific socio-economic and health realities.

PATIENTS AND METHODS

This was an analytical cross-sectional study conducted in the Department of Pediatrics at the Mother and Child University Hospital (CHU-ME) of N'Djamena. The study was carried out over a six-month period, from December 5, 2023, to May 30, 2024. The study population consisted of children living with HIV, under the age of 15, who were regularly followed up in outpatient consultations at the CHU-ME. Children were included if they were under 15 years old, had a confirmed HIV infection, had been on antiretroviral therapy (ART) for at least six months, were accompanied by a consenting parent or legal guardian, and had a complete and available medical record. Children newly initiated on ART, those whose guardians refused consent, or those with incomplete medical data were excluded. An exhaustive sampling method was used, including all children who met the inclusion criteria during the study period. The variables studied included a therapeutic adherence, the sociodemographic factors (age, sex, education level of the child and guardian, marital status, occupation), the clinical factors (age at diagnosis, WHO stage, history of hospitalization, ART regimen), the therapeutic factors (type of regimen — once-daily vs multiple doses, treatment tolerance, treatment duration), and the psychosocial factors (family support and disclosure of HIV status to the child). The survey was conducted during children's follow-up consultations. The parent or legal guardian was interviewed at each visit. After inclusion, children were seen monthly for three months, then again at the sixth month of follow-up. Data collection on adherence was mainly based on information gathered during ART dispensing. Individual interviews were conducted each month during drug refills using a specific questionnaire. Pill counts and verification of appointment dates were also performed in the presence of the responsible parent, especially when there were delays, which could prompt reassessment of the patient's declarations. Quantitative adherence was estimated based on the number of missed doses during the month preceding drug dispensing. It was calculated as the difference between the number of pills prescribed and the number of remaining pills. The timing of doses was also considered. A good adherence was defined as regular treatment intake without omissions or grouped doses, at the correct dosage, reaching the 95% threshold set by the WHO. A 95% adherence level generally means that no more than one dose can be missed per month when the treatment is taken twice daily. A poor adherence corresponded to taking less than 95% of prescribed doses. A good intake referred to 100% or ≥95% of prescribed doses. Missed doses corresponded to omitting at least one dose in a day or in a month. An overdose was defined as taking more medication than prescribed. An underdose was when the amount taken was lower than prescribed. Non-adherence to schedule meant taking medications at incorrect times. Data were collected using a structured, face-to-face questionnaire administered to the child's legal guardian by a trained investigator, as well as from medical records (for clinical and biological variables) and pharmacy dispensing sheets. Data were entered and analyzed using SPSS version 25.0. The significance threshold was set at $p < 0.05$. Authorization was obtained from the Dean's Office and the CHU-ME administration before conducting the study. Parental or guardian consent, as well as anonymity and confidentiality, were strictly respected.

RESULTS

Sociodemographic characteristics

A total of 210 children living with HIV were included in the study.

The mean age was 8.6 ± 3.2 years (range: 2 to 14 years). Most of the children were aged 5 to 9 years (42.9%, n=90), followed by those aged 10 to 14 years (35.7%, n=75).

Children under 5 years represented 21.4% (n=45). The sex distribution was relatively balanced, with a slight male predominance (52.4% vs 47.6% for females), giving a sex ratio of 1.1.

Regarding guardianship, 58.1% (n=122) of the children were cared for by single mothers, 25.2% (n=53) lived with both parents, and 16.7% (n=35) lived with another family member.

Concerning the educational level of guardians, 40% (n=84) had no formal education, 34.8% (n=73) had primary education, and 25.2% (n=53) had secondary or higher education.

Clinical and therapeutic characteristics

The mean duration on ART was 4.2 ± 2.1 years. The majority of children (71.9%, n=151) were on the Abacavir (ABC) / Lamivudine (3TC) / Dolutegravir (DTG) regimen, 17.6% (n=37) were on Abacavir (ABC) / Lamivudine (3TC) / Lopinavir / ritonavir (LPV/r), and 10.5% (n=22) were on Abacavir (ABC) / Lamivudine

(3TC) / Atazanavir (ATZ). According to the WHO clinical staging, 61.9% of the children were at Stage I–II, and 38.1% at Stage III–IV, as shown in Table I.

Table I: Clinical and therapeutic characteristics of the children.

Variables	n	%
Duration on ART		
< 2 years	48	22,9
2–5 years	110	52,4
> 5 years	52	24,7
ART regimen		
Abacavir(ABC)/Lamivudine (3TC)/Dolutégravir (DTG)	151	71,9
Abacavir(ABC)/Lamivudine (3TC)/Lopinavir/ritonavir (LPV/r)	37	17,6
Abacavir(ABC)/Lamivudine (3TC)/Atazanavir(ATZ)	22	10,5
WHO clinical stage		
I–II	130	61,9
III–IV	80	38,1

Therapeutic adherence

Among the 210 enrolled children, 152 (72.4%) had good adherence (≥95% of doses taken), while 58 (27.6%) showed insufficient adherence.

Factors associated with therapeutic adherence

The factors significantly associated with good adherence were the guardian's education level of secondary or higher (OR = 2.1; p = 0.03), the strong parental support (OR = 3.2; p = 0.001), the disclosure of HIV status to the child (OR = 2.3; p = 0.01), the simple ART regimen (once-daily dosing) (OR = 2.9; p = 0.002), and the regular attendance at follow-up visits (OR = 3.8; p < 0.001). These results are summarized in Table II.

Table II: Factors associated with good adherence.

Facteurs	OR (IC95 %)	p-value
Guardian's education level ≥ secondary	2,1 (1,1–4,3)	0,03
Strong parental support	3,2 (1,6–6,5)	0,001
Disclosure of HIV status	2,3 (1,2–4,6)	0,01
Simple ART regimen (1 dose/day)	2,9 (1,4–6,1)	0,002
Regular follow-up visits	3,8 (1,9–7,3)	<0,001

DISCUSSION

In our study conducted at the Mother and Child University Hospital (CHU-ME) in N'Djamena, 72.4% of children under the age of 15 living with HIV had good therapeutic adherence.

The factors identified as being associated with good adherence were: strong parental support, the guardian's education level, disclosure of the child's HIV status, a simple therapeutic regimen (once-daily dosing), and regular follow-up visits.

These results confirm that adherence in children relies on a combination of family, educational, social, and organizational determinants.

The adherence rate obtained in our study is comparable to those reported by Kouanfack et al. (Cameroon), Sidibé et al. (Mali), and Ouedraogo et al. (Burkina Faso), who found adherence rates of 70%, 75%, and 68%, respectively.[6–8]

These rates are slightly lower than those observed in countries with broader access to pediatric formulations and simplified therapeutic regimens.

Parental support emerged as a key determinant, consistent with the findings of Yiryuo et al. (2024) in Southern Africa.[9]

These authors emphasized that the quality of family involvement, reminder mechanisms, and daily organization directly influence therapeutic success.

Disclosure of HIV status to the child also appeared as a favorable factor.

According to Lemma et al. (2022) in Ethiopia, children informed of their HIV status demonstrated a better understanding of their treatment and consequently better adherence.[10]

Our results highlight that disclosure, when conducted gradually and supported by psychosocial counseling, fosters the child's sense of responsibility.

The association between a simple regimen and better adherence can be explained by reduced pill burden and fewer missed doses.

Mutagonda et al. (2022) in Tanzania showed that dolutegravir-based regimens were well tolerated and facilitated adherence.[11]

Similarly, Meque et al. (2024) in Mozambique reported improved virological outcomes following the introduction of pediatric dolutegravir.[12]

Regular follow-up visits promote adherence by allowing close monitoring, early detection of difficulties, and repeated counseling.

The literature shows that pediatric adherence is multifactorial and differs from that of adults, as it is strongly influenced by a third actor — the parent or guardian — as well as by sociocultural and structural determinants.

Among the factors associated with good adherence are the knowledge and understanding of HIV by the guardian, the family and community support, the household stability, absence of stigma, the simplicity of the therapeutic regimen, the regular access to health services, and the constant availability of ARVs.[13,14]

These determinants have been identified both in observational studies and in systematic reviews conducted in sub-Saharan Africa.

The clinical importance of therapeutic adherence is underscored by its close correlation with virological and clinical outcomes.

Poor adherence is associated with increased risks of morbidity, hospitalization, and the development of drug resistance, which may limit future therapeutic options.[15]

CONCLUSION

This study demonstrates that pediatric adherence depends on several determinants the family factors (parental support, guardian's education), the disclosure of HIV status, the therapeutic factors (simplicity of the regimen), and programmatic factors (regular follow-up).To improve outcomes, it is essential to strengthen therapeutic education for guardians, to generalize simplified dolutegravir-based regimens, to promote progressive disclosure, and to ensure regular follow-up. These interventions are aligned with international recommendations and could reduce virological failure among children living with HIV in Chad.

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