Original Research

Factors related to non-adherence to antiretroviral treatment in children under 13 years of age

Eva María López-De La Espriella [ID], Hiltony Stanley Villa-Dangond [ID], Camilo Guzmán [ID]

Abstract

Background: The Human Immunodeficiency Virus and Acquired Immunodeficiency Syndrome (HIV/AIDS) constitute one of the main public health problems worldwide. With the appearance of antiretroviral treatments (ART), the history of the disease has changed, going from being highly fatal to being considered a chronic disease, since these drugs contribute to improving the quality of life of these patients by preventing replication viral. **Objective:** To identify adherence to antiretroviral treatment in children under 13 years of age living with HIV/AIDS. **Methods:** Descriptive, retrospective study with a quantitative approach. The population was made up of 21 children under 13 years of age living with HIV/AIDS and their family caregivers. The "Morisky Medication Adherence Scale-8 items (MMAS-8)" was used, and the SPSS statistical program was used for data processing. Version 21. **Results:** The majority of minors are unaware of the diagnosis (86%), are female (57.1%), live with their biological parents (81%), whose parents or caregivers earn less than the current minimum monthly wage (90.5 %), level of education of the primary caregiver complete (61.9%), non-adherent to antiretroviral treatment (71.4%) the factors associated with non-adherence identified are socioeconomic (Significance 0.004), and those associated with side effects of medications, which were estimated using the Chi square test for categorical variables and the T Student test for quantitative variables, selecting an α=0.05 and a confidence level of 95%. Conclusions: Poverty is a conditioning factor for practices that lead to non-adherence to antiretroviral treatment.

Keywords: therapeutic adherence; antiretroviral treatment; children; HIV/AIDS

INTRODUCTION

HIV/AIDS is one of the main current public health problems worldwide, because it is one of the main causes of mortality from communicable diseases. This disease affects people indistinctly regardless of their age, sex, economic condition, race, or educational level; and it has a great impact at a psycho-affective, social and economic level, becoming a challenge for health systems in the world.[1]

Maternal-Child Transmission (MTCT): Vertical transmission or mother-to-child transmission is the transmission of HIV from an infected mother to her child, either during pregnancy through the placenta, during labor, or at the time of delivery by coming into contact with the mother's blood, or through breast milk, with the time of delivery being the situation that contributes the most to the increase in cases, with a percentage of 60-70% of the total, followed by breastfeeding and intrauterine transmission , by 30 to 40% and 10%, respectively.[2]

HIV/AIDS infection in the pediatric population: Unfortunately, research in children with HIV infection is not going at the same

rate as in adults. Although there are many medications in pediatric presentations, there are no specific pharmacokinetic studies for different ages; It is necessary for the pharmaceutical industry to try to guarantee that all drugs approved for adults are offered for pediatric use at the same time. With the increase in the HIV/AIDS epidemic worldwide, efforts and advances to address it include improved access to diagnosis, treatment and prevention programs, both at the country and regional levels, as well as improved the technique in the collection and calculation of statistical data that today indicate a trend in the reduction of the number of new infections, which in turn come from a decrease in risk behaviors.[3]

In Colombia, the behavior of HIV does not escape the world reality, because the infection adds more and more cases each year. According to notification data of HIV/AIDS to the National Public Health Surveillance System (SIVIGILA), since 1985, the notification of cases has had an increasing trend, until the epidemiological period XI week 47 of 2021, 14,698 cases have been notified, 30.1% more cases than those notified until the same epidemiological period of 2020. The national notification rate is 28.8 cases per 100,000 inhabitants, also higher than that of the epidemiological period XI of 2020. However, the HIV/AIDS notification rates of 2021 They are like those of 2019, due to the decrease in notifications that occurred in 2020, which may be related to the impact of the COVID-19 pandemic on some activities of the health services. The incidence rate, which excludes cases diagnosed in previous years and those from other countries, is 26.0 cases per 100,000 population. This incidence rate is exceeded in Cali (42.6 cases per 100,000 inhabitants), Bogotá (40.6), Risaralda (39.7), Barranquilla (38.2), Cartagena (36.8), Quindío (34 .2), Antioquia (32.2),

Eva María López -De La ESPRIELLA. Magister, Professor Departament of Pharmacy, University of Córdoba, Colombia. evalopezd@correo.unicordoba.edu.co
Hiltony VILLA. Magister, Professor Departament of Pharmacy, University of Córdoba, Colombia. hsvilladangond@correo.unicordoba.edu.co
Camilo GUZMÁN*. PhD. Professor Departament of Pharmacy, University of Córdoba, Colombia. cantonioguzman@correo.unicordoba.edu.co

Norte de Santander (28.5) and Córdoba (26.1 cases per 100,000 inhabitants).[2] In the demographic distribution, of the total number of reported cases, 81.1% were registered in the male sex; 2.7% in people from abroad and 1.6% in pregnant women. The probable mechanism of transmission was sexual in 98.0% of all cases; mother-to-child transmission occurred in 0.5% of cases.[4]

Antiretroviral therapy in boys and girls under 13 years of age not only depends on factors related to the patient, but also depends on factors related to caregivers, because in this age group multiple factors converge, including: the patient's age, ignorance of his illness, dependency to receive treatment from an adult, level of schooling, rejection of medications due to their bad taste; all factors contribute to the child not easily adhering to the therapeutic regimen, which leads to a deterioration in her health and therefore to the detriment of her quality of life.

Therapeutic adherence in the department of Córdoba becomes a weak point of antiretroviral therapy, in relation to the factors associated with non-adherence, among which are: the use of more than one medication, multiple doses per day, different adverse effects related to medication, long-term pharmacotherapy, false beliefs, fear of social rejection, depression, among others. Situation that directly affects the increase in cases of human immunodeficiency virus and acquired immunodeficiency syndrome (HIV/AIDS) in Colombia. Children are no exception, as they also present problems related to adherence to antiretroviral treatment, due in large part to the fact that administration is the responsibility of the caregiver, who must do it in a timely and continuous manner, to achieve the desired levels. of the drug in the bloodstream, and thereby keep the immune system active; thus, achieving that the person living with this pathology has a quality of life, for which their viral load must be maintained and their CD4 levels high. The objective of this study was to identify adherence to antiretroviral treatment in children under 13 years of age living with HIV/AIDS.

MATERIALS AND METHODS

A descriptive, retrospective, cross-sectional study with a quantitative approach was carried out. The target population was 23 children, under 13 years of age, diagnosed with HIV/AIDS, affiliated with an EPS in the department of Córdoba, who attended control at the health-providing institutions (IPS), in the municipality of Montería. The information was collected from 21 caregivers who agreed to participate in the study, who expressed their authorization by reading and signing the informed consent form. The medical records of the children participating in the study were reviewed, and a survey based on validated tests, such as the Zung test, was applied to them[5] and the self-efficacy scale.[6] The validation of the survey was carried out using Cronbach's Alpha, to estimate the reliability of the study. The variables analyzed were children's knowledge of the diagnosis, sex, age, type of dwelling, municipality of residence, social security, cohabitation situation, level of schooling, housing conditions, sanitation and/or basic services; regarding

the children and regarding the caregivers: relationship with the patient, level of schooling, monthly income, state of mind and level of self-efficacy of the children's family caregiver.

To measure therapeutic adherence, the Morisky Green Test was applied to the behavior related to the administration and intake of the treatment among children under 13 years of age. The "Morisky Medication Adherence Scale-8 items (MMAS-8)" is a structured measure that is applied to medication-taking behavior; it is widely used in different cultures; it was validated in its psychometric properties for use in the Spanish language by Carlos De las Cuevas, Wenceslao Peñate.[7] In this Likert scale-type instrument, 8 positively formulated questions are presented; however, to avoid bias, the wording of question 5 is inverted to avoid the tendency of the respondent to respond in the same way to a series of questions, without considering their content.

The response options are "yes" or "no" for items 1 to 7, while item 8 is answered according to a five-point Likert-type response scale. In the measurement of adherence, each negative response is scored as 1 and each positive response is scored as zero; except for item 5 in which the positive response is valued as 1 and the negative response as zero. For item 8, the code (0-4) must be normalized by dividing the result by 4 to calculate the total score.[7]

Due to the values of the MMAS-8 scale, the total score range goes from 0 to 8, which is interpreted in the sense that a score of 8 classifies the subject with high adherence to treatment; scores 7 or 6 reflect medium adherence and scores equal to or less than 5 classify low adherence.

For data processing, the SPSS Statistical Program was used. Version 21. For nominal variables, absolute numbers and percentages were used as summary measures, synthesizing the information in diagrams. For continuous quantitative variables, measures of central tendency (mean and/or median) and of dispersion (standard deviation and/or interquartile range), the information was also synthesized in diagrams, where the distribution of the data was observed.

In the bivariate analysis, the clinical and pharmacological characteristics were compared in relation to adherence to treatment. So, for the quantitative variables, the calculation of means and medians with their respective standard deviations/interquartile ranges represented with a box-and-whisker plot and the determination of the differences using Student's t tests with a previous test were used. of normality of the frequency distribution of the variables. The distribution of the variables was evaluated using the Shapiro-Wilk test, as it is recommended for less than 30 data, as is the case in this study. For the nominal qualitative variables, proportions were calculated, and differences were established by means of the X2 test.

Ethical aspects

This research was carried out taking into account the current ethical regulations: Declaration of Helsinki.[8] Resolution 8430 of 1933.[9] Statutory Law 1266 of 2008.[10] The Nuremberg code and

the international ethical guidelines for the biomedical research on human beings,[11] was classified as a medium risk research according to Resolution 8430 of 1933 of the Ministry of Health of Colombia, because sensitive information was investigated.

RESULTS

The population of this study shares similar characteristics among them, as is the case of belonging to a socioeconomic condition considered absolute poverty, for this population in particular, all earn less than one SMMLV, so the variables were grouped to form the data on the poor population and the non-poor population, thus forming an Indicator of Unsatisfied Basic Needs INBI.[12] (Figure 1 and Figure 2)

In relation to knowledge of the diagnosis, it was identified that 86% of minor children living with HIV do not know their diagnosis, so the caregivers were the ones who answered the survey.

The characteristics of the cohabiting children report that there is a homogeneous distribution between the sexes (male 57% - female 43%), the age range was distributed into two categories, as stipulated in the clinical practice guide based on scientific evidence for care for HIV infection in girls and boys under 13 years of age, predominating in the sample of cohabitants children over three years of age and under 13 years of age (95.20%).[13] (Figure 3)

The sample analyzed according to place of residence was spatially distributed in 12 (40%) of the 30 municipalities of the Department of Córdoba, with the Municipality of Montería, where the highest percentage of children diagnosed with HIV/AIDS resides.

Regarding the situation of coexistence, of the children it was found that the highest percentage (76.20%) live with their parents, and they are children who are studying, at the different educational levels, which correspond to their ages and to a lesser extent proportion, children who did not attend school were found, caregivers with a basic educational level, related to primary school, predominate (52.40%).

To differentiate the possible causes of non-adherence, the caregiver's state of mind was evaluated, in this aspect it was possible to show that the largest proportion is in the normal range (81%) in a lower percentage are found with alterations at the level of the "slightly depressed" scale (19%). Mood state was assessed using the Zung Test. It was applied only to the caregivers of the patients because the children do not know their diagnosis. To determine the level of self-efficacy of the caregiver, the Baessler and Schwarzer general self-efficacy scale was applied to the caregiver of the children participating in the study, identifying a high level of self-efficacy (47.60%); The results show that, according to the scale, less than the average of the caregivers have appropriate feelings of confidence in their own abilities to adequately handle certain stressors of daily life.[5]
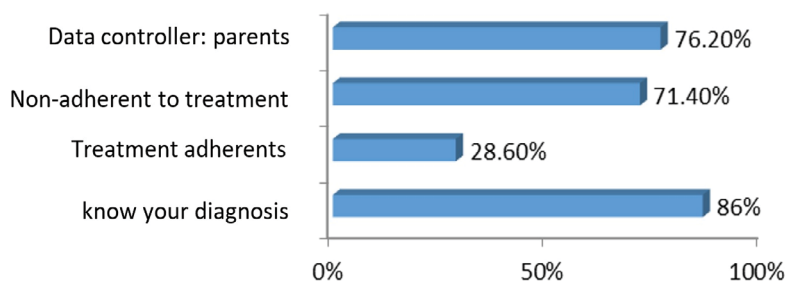

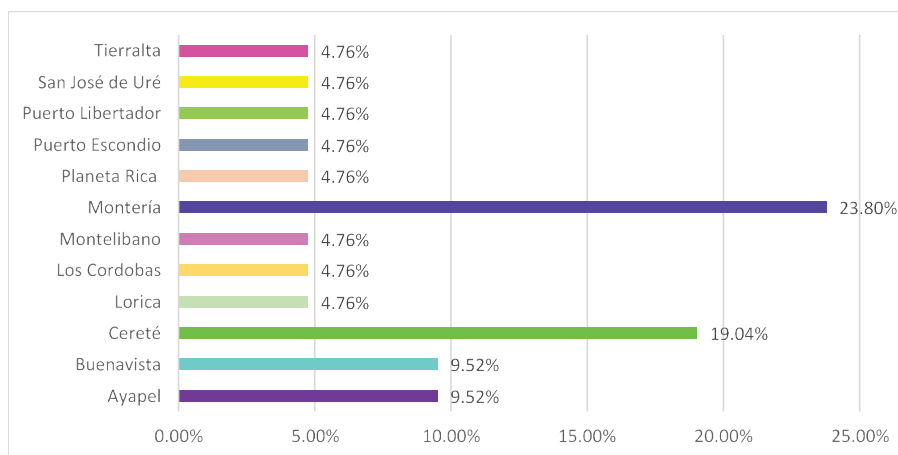**Figure 1.** Información general Font. Study database.

Figure 2. Municipalities of residence of those under 13 years of age diagnosed with HIV/AIDS. Font. Study database
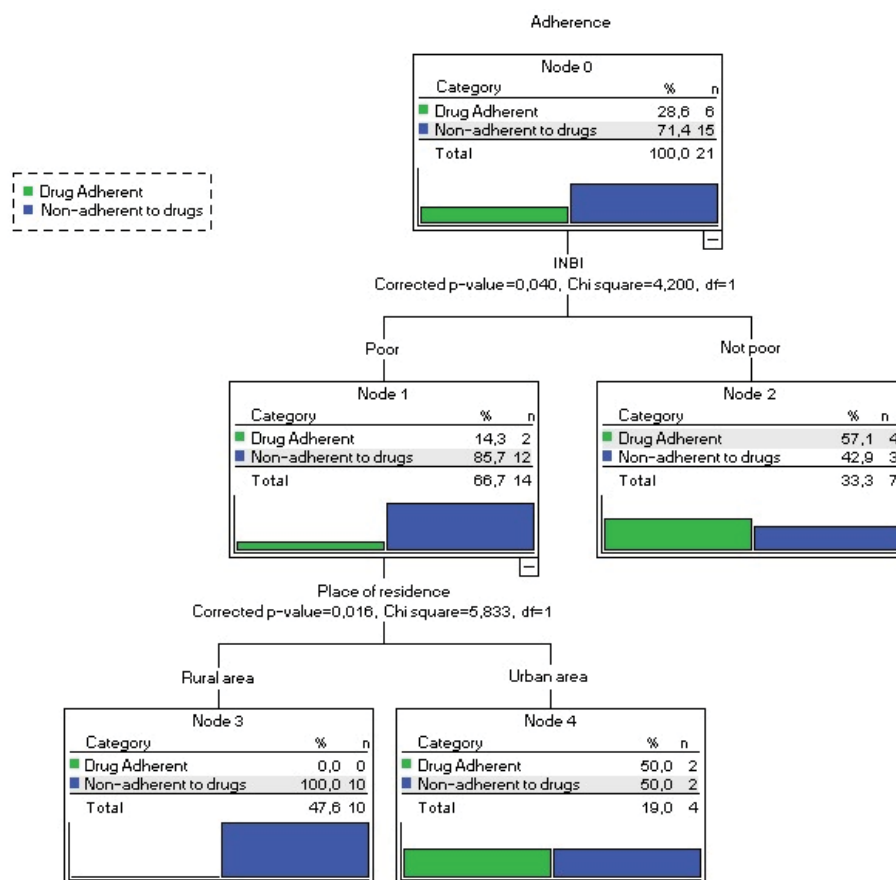
Figure 3. Decision tree of children under 13 years diagnosed with HIV/AIDS. Font. Study database

In the results of the Morisky Green Test, it was identified that 71.40% classify as "non-adherent to antiretroviral treatment" and 28.6% meet the criteria to be classified as adherent. Among the non-adherent cases, factors related to each other are shared, which directly affect non-adherence to treatment, such as socioeconomic factors expressed in the low monthly income of parents/caregivers, which is ultimately reflected in the quality of life of this population, perhaps secondary to the low educational level of the caregivers. Another aspect identified as important in the non-adherence to antiretroviral treatment in children are aspects related to the texture and taste of the medications, since according to the caregivers, "the children refuse to take the medications"; "the medicines have a bad taste, which makes them want to vomit".[14]

Other aspects identified in the therapeutic non-adherence is the failure in the responsibilities assigned to the caregiver regarding the supervision of the intake of the prescribed ARV drugs; It was found in the sample that there are occasions in which the caregiver delegates the responsibility of the self-administration of medications to the children without any type of supervision; This practice was evidenced in particular among caregivers of children who are not adherent, with expressions such as "I order the child to take the medication".

Clinical failure was found in 30% of the studied sample that is not adherent to drugs, and among those who do not present clinical failure, 45% were found to be non-adherent to drugs; descriptive statistics then show erratic results regarding the possible relationships between clinical failure and non-adherence to treatment.

The clinical characteristics were categorized based on therapeutic or treatment failure, which occurs when the antiretroviral drugs used by the patient do not control viral replication. In this case, they were evaluated by comparing the current data with those recorded in the diagnosis of the syndrome.

There are three types of therapeutic failure: virological failure, immunological failure and clinical failure.

Virologic failure occurs when antiretroviral drugs cannot reduce the amount of virus in the blood. (Although the patient is following a therapeutic regimen according to her needs, and the viral load continues to be high, or being at low levels, it rises repeatedly after having fallen).

Clinical failure occurs when a person has symptoms of HIV disease despite taking antiretroviral drugs. The three types of therapeutic failure can occur alone or simultaneously.

In this way, each type of therapeutic failure was typified and related to adherence to treatment with the Chi-Square (X2) test using contingency tables.

For this study, taking a statistical significance value of 0.05, it was found that none of the 3 types of failure showed a P-Value above 0.05 applying Pearson's Chi-square method; verifying that in the analyzed sample there is no evidence of statistical significance between therapeutic failure and adherence.

It should be noted that in the three types of failure, the P-value was below 0.10; which shows that there is a degree of association between the variables and very likely if there were more data, this would improve the significance.

Among the failures associated with therapeutic non-adherence are comorbidities, when these are present in patients receiving antiretroviral treatment, there is evidence that there is some type of therapeutic, immunological, or clinical failure. In the contingency charts, 27.7% of non-adherent children have comorbidities, but also 38.8% of children and are not adherent to antiretroviral therapy but do not have comorbidities. Among the three main comorbidities reported are endocarditis, meningitis, and pneumonia. When performing the statistical correlation, it is evident that the P-Value was below 0.1, so it is interpreted that there is a degree of association but that it is not statistically significant. Among the non-adherent cohabiting children, it was found that 31.5% presented opportunistic diseases and among those adherents to antiretroviral treatment, there were no patients presenting this clinical picture.

A strong statistical relationship was found between adherence to treatment and the presence of opportunistic diseases (P-Value = 0.44), data that show that the presence of opportunistic diseases is closely related to non-adherence to pharmacotherapeutic treatment in children who they live with the virus; which can be explained as a cause-effect relationship and also as a negative categorical relationship: the less adherence to treatment, the higher the probability of presenting opportunistic diseases and co-morbidity.

DISCUSSION

Ignorance of the diagnosis in these patients can lead to not reaching the desired levels of adherence to antiretroviral treatment, which reaffirms the study of the living conditions of children infected with HIV/AIDS in San Luis Potosí. Mexico: In this regard, it is understood that parents and caregivers are afraid to provide this information because they do not know how to do it and because they believe that it will be difficult for the child to know him or her. This situation can also be related to the fear of social stigmatization experienced by children with HIV, as well as the difficulty of families in making decisions about disclosing the disease even within the family context.

Age is a factor that has been reported to influence therapeutic adherence, but irregularly added to this, it was found in this population that incident biological factors converge, such as the age of the children, most of whom are in the stages of puberty and early adolescence (95%), who added to the lack of knowledge of the contagion, may manifest negative reactions or attitudes against the dependency of the caregiver to follow the medical indications related to antiretroviral therapy; the stage of the life course added to the low adherence of these cohabitants (who are unaware of their illness), represents an imminent risk to public health due to the high potential for sexual transmission of HIV to their sexual partner, even more so considering that among the young people there is a tendency to start relationships early; Contrary to the study of adherence to antiretroviral treatment in children, where the average age of the children was 2.5 years.[15]

Regarding gender distribution, it was evidenced in the study sample that the highest percentage belongs to the male gender. As has been reported in other studies, both globally and nationally. Since HIV/AIDS is recognized as a disease of interest in public health, it is worrying, the large proportion of children infected with this stigmatizing disease, efforts must be joined, both by local health directorates, insurers, and health care providers health services, to strengthen institutions that are friendly to women and children, to provide education to this population group, and thus prevent the disease from continuing to spread and thereby help achieve the goals of sustainable development.[16]

Most of the children diagnosed with HIV live with their biological parents in nuclear families, so there may be a greater degree of affinity and affectivity in the upbringing of children; children who live with siblings, grandparents/uncles, it is because they are orphans because their mothers died of AIDS, or due to parental abandonment, a situation similar to that which has occurred worldwide, which has been reviewed by UNICEF where It is exposed that countless children live with relatives because they have lost one or both parents due to AIDS. This pathology has devastating consequences among the child population, either because they suffer from it or because they live with a relative who has been diagnosed with it.[13]

According to age, it would be expected that only 5% would be out of the school environment because they belong to children under 3 years old, this implies that 23.8% of cohabiting children have been excluded from school and education, either for presenting comorbidities, or for being rejected in educational centers upon learning of the disease that affects them, which even today continues to be stigmatized. What is related to the UNICEF study entitled: Protecting children affected by HIV and AIDS, in which it is reported that this disease shortens childhood. Children stop going to school to care for their dying parents or to earn money.[17]

In the sample of caregivers responsible for the treatment of cohabiting children, it can be inferred that the majority earn less than the current legal monthly minimum wage; the cohabiting children of the analyzed studies have in common that they belong to the population group classified as poor; Similar findings were found with the research Social and economic impact of HIV on individuals and families in Bogotá, 2008-2009; in the study the micro and macro social processes of the context in which it was evidenced that at least 28% of the participants do not earn any type of income; with unemployment of more than a month of 40% due to HIV; 29% have had to quit their jobs and 8% have been fired due to stigma related to the disease; As has been analyzed in the results,

the precarious economic conditions affect non-adherence to treatment due to factors associated with nutrition, food failures for any of the day's rations results in the non-administration of ARV mediation; Due to the aforementioned, in the sample of pediatric cohabitants in Monteria, it was identified that the main cause of non-adherence that prevents children from receiving antiretroviral treatment is lack of food, due to the fact that taking the treatment in these children is conditioned by their caregivers to having food, as expressed by the caregivers: "if I have to give my child food, I give him the medicine, if I don't have to give him food I can't give him food , because they are very strong and they get heartburn".[18]

Regarding the mood of the caregiver of children with non-adherence to treatment, the findings of this study are contrary to the study "Comparison of the quality of life of family caregivers of people living with HIV/AIDS and receiving antiretroviral therapy with the quality of life of family caregivers of people with HIV/AIDS and do not receive antiretroviral therapy in Honduras", in which on a sample of 120 caregivers, it was concluded that both groups of caregivers have negatively affected quality of life, in especially in the dimensions of physical and psychological well-being.[19]

When contrasting this study with the one carried out in Chile, Carers of children living with HIV, their knowledge, and their self-efficacy, share the high level of self-efficacy of their caregivers, in the care of children diagnosed with.[20]

CONCLUSIONS

Poverty is a conditioning factor for practices that lead to non-adherence to antiretroviral treatment.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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AUTHORSHIP CONTRIBUTION STATEMENT

All authors contributed to the conception and design of the study. EL completed the day-to-day research activity, recruitment, data collection and data entry. EL, HV and CG drafted the manuscript, and all authors approved the final manuscript.

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