Description of a specialized outpatient clinic as a reference center for children and adolescents living with HIV/AIDS in southern Brazil

Descrição de um ambulatório especializado referência em crianças e adolescentes vivendo com HIV/AIDS no sul do Brasil

Emanuela da Rocha Carvalho[1], *Tony Tannous Tahan*[2], *Andrea Maciel de Oliveira Rossoni*[2], *Cristina de Oliveira Rodrigues*[3]

ABSTRACT

Introduction: Children living with HIV/AIDS require specialized care. **Objective:** To describe clinical and epidemiological characteristics of patients living with HIV/AIDS. **Methods:** Observational, descriptive study using medical records data of patients with HIV/AIDS under 14 years of age. Approved by the institution's Ethics Committee under number 1,432,517. **Results:** 60 cases were included; the median follow-up duration was 6.8 years; 50.0% were male; 88.3% were white; 75.0% were from the capital and metropolitan region. Prenatal records were available for 51 cases, but only 44.6% received antiretroviral therapy (ART) during pregnancy (mean duration of 3.3 months). HIV diagnosis was based on clinical symptoms in 28.3% of the cases, occurring in similar proportions for both childhood common infections and opportunistic infections. According to the CDC clinical classification (1994), at the start of follow-up, 56.6% of patients had moderate or severe symptoms, which would be reduced to only 18.3% upon reclassification at the last visit (p=0.016). Initially, 41.7% showed evidence of immunosuppression, compared to 19.9% at the time of the study (p=0.5). Only 6.6% remained asymptomatic. A decrease in the average number of hospitalizations was observed during follow-up. **Conclusion:** Among the cases diagnosed based on clinical symptoms, half were attributed to common childhood infections and lacked immunosuppression.

Keywords: Pediatrics. AIDS. Comprehensive health care.

RESUMO

Introdução: Crianças que vivem com o vírus da imunodeficiência humana — HIV/AIDS requerem atendimento especializado. **Objetivo:** Descrever características clínicas e epidemiológicas de pacientes que vivem com HIV/AIDS. **Métodos:** Estudo observacional, descritivo, com dados de prontuários de pacientes com HIV/AIDS de até 14 anos de idade incompletos, aprovado pelo Comitê de Ética em Pesquisa da instituição sob o número 1.432.517. **Resultados:** Foram incluídos 60 casos. A mediana de acompanhamento foi de 6,8 anos; 50,0% eram do sexo masculino; 88,3% brancos; 75,0% naturais da capital e região metropolitana. Em 51 prontuários havia descrição de pré-natal, porém apenas 44,6% fizeram uso de terapia antirretroviral (TARV) na gestação (tempo médio de 3,3 meses). Em 28,3% o HIV foi pesquisado por sintomas clínicos, que ocorreram em proporções similares tanto por infecções habituais da infância como por oportunistas. De acordo com a classificação clínica dos Centers for Disease Control and Prevention — CDC (1994), ao início do acompanhamento, 56,6% dos pacientes apresentavam sintomas moderados ou graves e, na última consulta, se fossem reclassificados, seriam apenas 18,3% (p=0,016). Incialmente, 41,7% apresentavam evidência de imunossupressão, comparativamente aos 19,9% na ocasião do estudo (p=0,5). Apenas 6,6% permaneceram assintomáticos. Com o acompanhamento, verificou-se diminuição na média do número de hospitalizações. **Conclusão**: Dos casos que apresentaram seu diagnóstico por sintomas clínicos, metade foi por infecções habituais da infância e sem imunossupressão.

Palavras-chave: Pediatria. AIDS. Assistência integral à saúde.

INTRODUCTION

In 1983, the first reports of pediatric AIDS were described[1]. The majority of pediatric HIV infections are acquired through vertical transmission during pregnancy, childbirth, or postnatally via breastfeeding. Over 90% of HIV-infected children worldwide have acquired the virus through this route. The vertical transmission rate varies approximately from 20 to 30% in the absence of prophylactic measures. Most vertical HIV transmissions (50 to 80%) occur during childbirth[2]. Thus, the epidemiology of pediatric HIV is directly linked to the success of vertical transmission prevention during prenatal care.

Globally, enhancements in healthcare aimed at preventing mother-to-child transmission of the virus have contributed to an annual decrease in new infections. However, it is estimated that, as of 2020, there have been 1.7 million children under the age of 15 living with HIV/AIDS, and only 52% have received antiretroviral therapy (ART)[3].

Clinical manifestations of HIV in infants and children are diverse. Symptoms such as recurrent upper respiratory tract infections, sinusitis, otitis, persistent oral candidiasis, recurrent parotitis, repeated pneumonias, chronic diarrhea, growth deficit, delayed neuropsychomotor development, and unexplained fever are often indicative of a pediatric diagnosis[4]. The most commonly observed AIDS-defining conditions in children under 13 years include *Pneumocystis jirovecii* pneumonia, severe and recurrent bacterial infections, cachexia, esophageal candidiasis, progressive multifocal leukoencephalopathy, Kaposi's sarcoma, HIV encephalopathy, cytomegalovirus pneumonia, colitis, encephalitis, disseminated or extrapulmonary tuberculosis, among others[5].

Improved access to specialized prevention of mother-to-child transmission (PMTCT) and antiretroviral therapy (ART) centers has

[1]Universidade Federal de Santa Catarina, Department of Pediatrics – Florianópolis (SC), Brazil. E-mail: emanuela.carvalho@ufsc.br
[2]Universidade Federal do Paraná, Complexo Hospital de Clínicas, Pediatric Infectious Disease Service – Curitiba (PR), Brazil. E-mail: tony.tahan@hotmail.com; dearossoni@gmail.com
[3]Universidade Federal do Paraná, Postgraduate in Child and Adolescent Health – Curitiba (PR), Brazil. E-mail: cristinarocruz@gmail.com

led to reduced mortality and new infection cases among children in developing countries[6]. Additionally, benefits of combined antiretroviral therapy in pediatrics include improvement in weight-height growth and neurological development[7].

OBJECTIVE

To describe demographic, clinical, and immunological data of children and adolescents living with HIV under care at the specialized service of a reference hospital in southern Brazil.

METHODS

Observational, descriptive study with retrospective data collection. The study included pediatric HIV/AIDS patients up to 14 years of age under follow-up at the pediatric infectious diseases outpatient clinic during the year 2015. The research was approved by the institution's human research ethics committee under protocol number 1,432,517.

The following variables were assessed:

Demographic characteristics (gender, race, place of origin);

Perinatal care (use of ART during pregnancy);

Clinical assessments (signs and symptoms at diagnosis and during follow-up);

Modes of HIV transmission (perinatal transmission, breastfeeding, sexual violence, unknown);

CDC clinical and immunological classification[5];

Number and reasons for hospitalizations.

The variables were compared considering the data from the beginning of follow-up and the last assessment recorded in the medical records.

Clinical and immunological classification of children followed recommendations of the 2017 Brazilian Ministry of Health protocol adapted from CDC[5].

Data were analyzed using *STATA*®12.0 statistical software. Quantitative variables were evaluated for mean (±standard deviation) or median (max/min), and qualitative variables were examined for frequencies and percentages. Comparative analyses employed non-parametric tests, including Pearson's Chi-square test and Fisher's Exact test. A significance level of 5% was applied in all analyses.

RESULTS

In the year 2015, 79 children and adolescents were under follow-up at the pediatric infectious diseases outpatient clinic. Among these, 18 were aged 14 or older, and 1 patient, who had not attended the last appointments, deceased in March 2015. Consequently, the study included 60 children and adolescents who were regularly monitored.

General patient characteristics

The median age at admission was 1.1 years (ranging from 0.04 to 12.7 years), with a current mean age of 8 years±3.5, and a median follow-up duration in the outpatient clinic of 6.8 years (ranging from 0.1 to 13.0 years). Further demographic details are presented in **Table 1**.

In 56 medical records, prenatal information was available, with 51 (91.0%) mothers having received prenatal care. The median duration of antiretroviral therapy use during pregnancy was 3.5 months (ranging from 0.5 to 9 months). 22 mothers breastfed their children for a period ranging from 0.5 to 24 months (median of 6 months). However, complete information for these data was not available in all medical records (**Table 2**).

Regarding the mode of HIV transmission, vertical transmission occurred in 56 (93.3%) cases (**Figure 1**). Among patients with vertical transmission, it can be noted that, in 2 cases, transmission occurred through breastfeeding.

The HIV diagnosis was investigated in 30 (50.0%) infants with perinatal exposure, in 17 (28.3%) children with clinical symptoms, in 11 (18.3%) due to maternal HIV diagnosis, and in 2 (3.4%) at the request of the guardian.

Among the children whose diagnosis was established based on clinical symptoms raising suspicion of HIV, in 53.0% of cases, it was due to common childhood infections (pneumonias, otitis and mastoiditis, acute viral bronchiolitis, and impetigo), while the remaining 47.0% were caused by opportunistic infections (*Pneumocystis jirovecii* pneumonia, cytomegalovirus disease, severe varicella, herpes zoster disease, fungi).

Comparative characteristics of patients

Comparing the clinical classification of patients at the beginning of follow-up and longitudinally, the study revealed that, initially, 34 (56.7%) children exhibited symptomatology classified as moderate or severe (class B or C), and, during the course of follow-up, 12 (20.0%) showed moderate or severe alterations (p = 0.016) (**Figure 2**).

Table 1. Demographic characteristics of patients under follow-up at the specialized HIV/AIDS outpatient clinic in southern Brazil in 2015.

Characteristic	n	%
Male	30	50.0
Female	30	50.0
Race		
White	53	88.3
Asian	1	1.7
Mixed race	4	6.7
Black	2	3.3
Place of birth		
Curitiba	30	50.0
Metropolitan area	15	25.0
Other states (RJ, SP, SC)	3	5.0
Other countries (Haiti)	1	1.7
Other regions of Paraná	11	18.3
Place of origin		
Curitiba	36	60.0
Metropolitan area	15	25.0
Other regions of Paraná	9	15.0
Legal guardian		
Sheltered	3	5.0
Adoptive	8	13.3
Family	21	35.0
Parents	28	46.7

Regarding immunological classification based on CD4 count, 25 (41.7%) children had moderate or severe immunosuppression (class 2 and 3) at the beginning, while during follow-up 11 (18.3%) had this classification (p=0.5) (**Figure 3**).

Table 2. Characteristics of prenatal, birth, and breastfeeding among patients under follow-up at the specialized HIV/AIDS outpatient clinic in southern Brazil in 2015.

Characteristic	n	%
Underwent prenatal care (n=56)	51	91.0
Number of appointments (n=12)		
2 or fewer appointments	7	58.3
More than 2 appointments	5	41.7
Prenatal care location (n=55)		
Teaching hospital	7	12.7
Basic health unit	43	78.2
Not mentioned	5	9.1
Use of ART during pregnancy (n=56)		
Median usage: 3.5 months	25	44.6
Intravenous zidovudine during birth (n=55)	30	54.5
Mode of birth (n=50)		
Cesarean section	28	56.0
Vaginal	22	44.0
Birth classification (n=52)		
Appropriate for gestational age	50	96.1
Small for gestational age	2	3.9
Gestational age (n=36): mean 37.3 (±2.77)		
Received breastfeeding (n=57)		
Median duration: 6 months	22	39.0
Need for neonatal ICU (n=58)	8	13.8
Respiratory distress	2	25.0
Extreme prematurity	4	50.0
Sepsis	1	12.5
Treatment for congenital syphilis	1	12.5

ART: antiretroviral therapy.

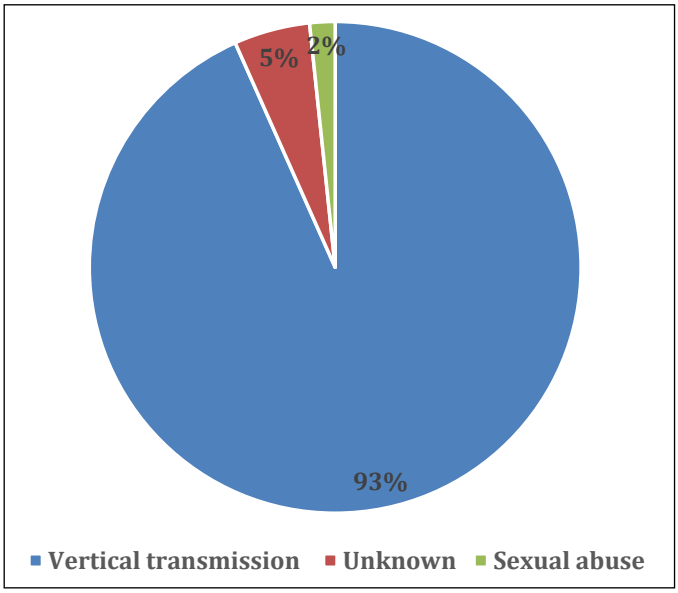

Figure 1. Mode of HIV transmission among patients in follow-up at the specialized HIV/AIDS reference outpatient clinic in southern Brazil in 2015.

When comparing the number of hospitalizations at the beginning and throughout the course of follow-up, a reduction in the mean hospitalizations from 1.6±0.23 (95%CI 1.09 to 2.00) to 0.4±0.10 (95%CI 0.24 to 0.63) was observed. Initially, 43 patients were hospitalized between 1 to 10 times, and evolutionarily, 19 patients were hospitalized between 1 to 4 times.

The main causes that led to hospitalizations in patients living with HIV/AIDS at the beginning of the follow-up were opportunistic infections in 17 (39.5%), and respiratory diseases in 15 patients (34.9%). In the evolution, mainly respiratory infections were observed in 11 cases (57.9%), and 2 (10.5%) opportunistic infections.

DISCUSSION

The primary mode of transmission identified in this study was vertical transmission, in line with the existing literature[8]. Since the implementation of preventive measures following the

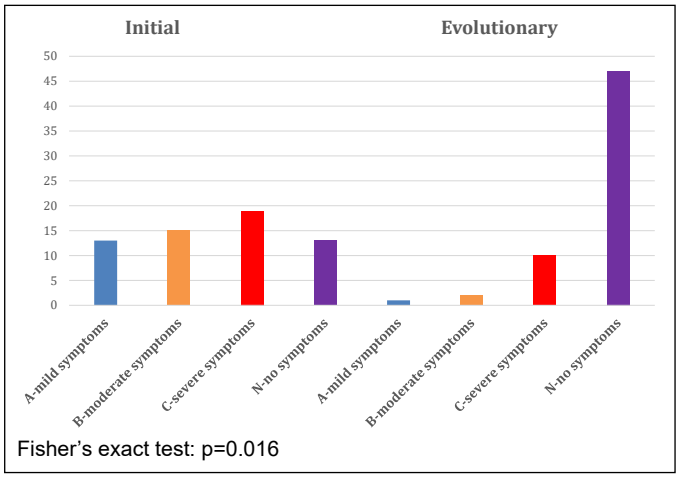

Figure 2. Evolutionary clinical classification according to CDC-94 among patients in follow-up at the specialized HIV/AIDS reference outpatient clinic in southern Brazil in 2015.

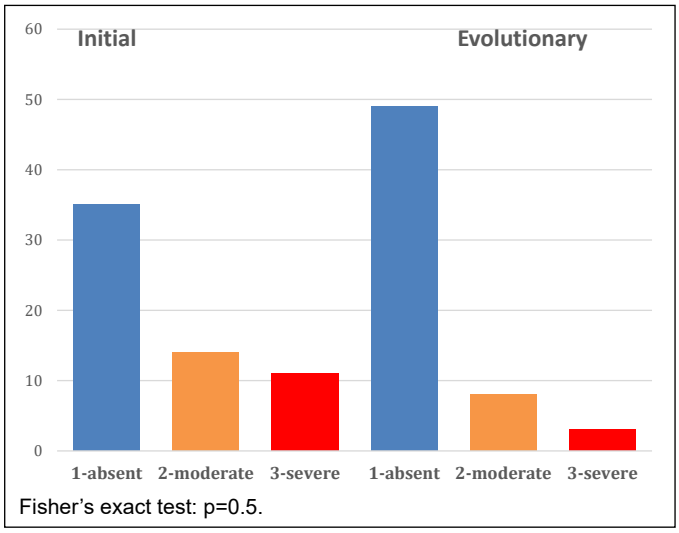

Figure 3. Evolutionary immunological classification according to CDC-94 in patients under follow-up at the specialized HIV/AIDS outpatient clinic in southern Brazil in 2015.

PACTG076 protocol in 1994[8], the incidence of new cases in children has been decreasing. However, breastfeeding transmission has been highlighted due to its insidious and constant pattern, as described in this research, despite currently well-structured policies, such as the government's provision of free infant formula since 2004. This is likely due to maternal HIV infection (new cases) occurring during the breastfeeding period. Therefore, the dissemination of information and guidance for seronegative breastfeeding mothers, advocating for condom use during lactation, and testing every 6 months is currently recommended by the Brazilian Ministry of Health[4].

The initiation of treatment in pregnant women should be as early as possible, regardless of their viral load and CD4 lymphocyte counts, seeking contribute more effectively to the reduction of vertical transmission[9]. However, in this study, the use of ART was employed in only 44.6% of pregnant women, with a median duration of 3.5 months during prenatal care, and only 54.5% used intravenous zidovudine during birth, which may have contributed to an increased risk of vertical transmission.

In this casuistry, 50% of the diagnoses were made due to the follow-up of exposed infants, reinforcing the importance of early maternal diagnosis and research. Historically, recurrent bacterial infections, such as pneumonia and bacteremia, predominated in children with HIV before the highly effective antiretroviral therapy era[10]. Nevertheless, in this study, symptomatic children exhibited usual infections in proportions comparable to opportunistic infections. Therefore, it is crucial to emphasize the importance of healthcare professionals suspecting the diagnosis when children appear with recurrent common childhood infections or atypical forms of common diseases, as well as opportunistic infections.

In 1994, the CDC developed a clinical and immunological classification for HIV/AIDS patients under 13 years of age. In this study, children were classified based on data obtained from medical records at the initial consultation, demonstrating that, at first, 35% of patients belonged to category C, and 18% had severe immunosuppression categorized as class 3. Nevertheless, in a multicenter study involving five Brazilian reference centers conducted from December 2009 to April 2011[11], it was found that, when admitted to specialized centers, 26% were clinically categorized as C, with signs of severe immunosuppression in 32% of the evaluated children, indicating that these rates may vary depending on the analyzed service. In the present study, a lower rate of immunosuppressed patients is justified due to the early diagnosis frequency in children with perinatal HIV exposure in half of the cases.

The CDC staging indicates the most severe level in an individual's life and does not foresee reclassification to a less severe category, even after clinical and immunological improvement[5]. Nonetheless, in many pediatric HIV/AIDS care services, constant reclassifications of patients are conducted to better assess the current clinical and immunological status. In this study, the evolutionary classification based on the last medical consultation in the outpatient clinic revealed that only 20% (p=0.016) of the patients were categorized as B and C, with only 3% exhibiting severe immunosuppression, demonstrating significant improvement. This underscores the importance of regular multidisciplinary outpatient care in enhancing the survival of children and adolescents living with HIV/AIDS.

In recent decades, studies have been demonstrating substantial trends towards reduced hospitalizations, admissions to intensive care units, and a decrease in opportunistic infections[12,13], due to the recommended use of antiretroviral treatment for all individuals living with HIV. As observed in the present study, there was a significant reduction in the number of hospitalizations when compared to the beginning of follow-up and over the course of monitoring.

Mother-to-child transmission has been significantly reduced over the years with the regular use of antiretroviral therapy, enabling the prevention of new infections and the effective control of the disease, thereby facilitating the transition of clinically stable youth to adult services that are well-managed and primarily focused on the aspect of manageable chronic illness.

Strengths

The study provided clinical and epidemiological information from a specialized outpatient clinic that serves as a reference for children and adolescents living with HIV. These valuable data allow the identification of potential barriers that hinder follow-up and therapeutic success.

Limitations

Due to the retrospective nature of the study involving the use of medical record data, it was not possible to apply more robust statistical tests in view of the limited number of cases.

CONCLUSION

The initiation of follow-up for children living with HIV, in half of the cases, occurred early, and continued until their transition to adult care services. Most mothers received prenatal care; however, antiretroviral therapy (ART) was initiated relatively late during pregnancy, and some children were breastfed. Among those children and adolescents diagnosed based on clinical symptoms, half had common childhood infections. When classified according to the CDC criteria, the majority of cases upon admission did not exhibit severe immunosuppression, and, over the course of follow-up, demonstrated significant clinical improvement.

Participation of each author

ERC: conceptualization, data curation, writing – original draft, writing – review & editing. TTT: writing – review & editing. AMOR: writing – review & editing. COR: writing – review & editing.

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Conflict of interest

The authors declare no conflicts of interest.

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Address for correspondence
EMANUELA DA ROCHA CARVALHO
Campus Universitário Reitor João David Ferreira Lima, s/n – Trindade
Florianópolis (SC), Brazil
CEP: 88040-900
Email: emanuela.carvalho@ufsc.br

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