

ORIGINAL ARTICLE

Epidemiological profile of Adolescents living with HIV/AIDS in Espírito Santo, Brazil: A cross-sectional study

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Abstract

Introduction: The AIDS epidemic has undergone several transformations, and, in recent years, there has been an increase in cases of HIV/AIDS among adolescents and young people. Thus, it is essential to know this population to base health actions scientifically.

Objective: This study aims to analyze the epidemiological profile of adolescents living with HIV/AIDS in Espírito Santo, Brazil.

Methods: A descriptive, sectional study in which notifications of HIV/AIDS among adolescents aged 13 to 19 between 2010 and 2020 were analyzed.

Results: 523 adolescents with HIV/AIDS were found in the analyzed period (an average of 47 cases/year). There was a predominance of male adolescents (68.8%), older than 16 years (mean=18.0 years), of mixed race/colour (54.6%), living in the metropolitan region near the capital. It was observed that the schooling of females is lower, with 47.2% of them in elementary school, while 45.0% of the boys are in high school. In most cases, the infection occurred via sexual intercourse, among men, through homosexual relations (55.0%), and among women, through heterosexual relations (82.2%). The HIV viral load was detectable in almost all (84.8%) cases, and 11 (6.8%) of these adolescents died.

Conclusion: The epidemiological profile of HIV and AIDS cases among adolescents in Espírito Santo shows a higher frequency of cases in males aged 16 to 19 years, with incomplete high school education, who acquired HIV through unprotected sex in homosexual relationships. We highlight the high percentage of young people with detectable viral loads and deaths due to complications of AIDS.

Keywords: Adolescent; HIV; acquired immunodeficiency syndrome (AIDS); health profile.

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Authors summary

Why was this study done?

Based on the trend of juvenilization of the population infected with HIV/AIDS, this study was proposed to analyze the epidemiological profile of adolescents living with HIV/AIDS in the state of Espírito Santo - Brazil, in order to subsidize actions and policies of prevention and treatment of HIV/AIDS.

What did the researchers do and find?

The researchers found a prevalence of notifications in high school males between 16 and 19 years old. The main route of infection was sexual, being more frequent in females, the heterosexual relationship and, in males, the homosexual relationship. Notably, most adolescents had detectable viral loads, and 11 deaths from AIDS complications were reported.

What do these findings mean?

Many adolescents with detectable viral loads signal public health problems, such as late diagnosis and lack of adherence to antiretroviral therapy (ART). As a consequence, we observed the premature death of 11 adolescents. Therefore, there is a need for planning and implementing actions to reduce new infections among adolescents, as well as measures that seek early detection of cases, improved access and adherence to antiretroviral treatment.

INTRODUCTION

The dynamics of the AIDS epidemic's continuous transformation, diversifying the profile of people infected with HIV, drive new studies to know who are vulnerable to infection and who are currently living with HIV. In this way, we seek to subsidize actions and policies to confront this severe public health problem¹⁻³. Studies have prioritized research among adults², in contrast to the new scenario that has emerged since HIV notifications have increased among pregnant women. These cases deserve special attention due to the risk of mother-to-child transmission of HIV^{4,5}.

Brazil's HIV/AIDS epidemic is considered stable at the national level. HIV prevalence in the general population is 0.4%. Despite the progressive decrease in reported cases since 2012, the situation still requires control, mainly regarding the diagnosis and follow-up of the younger population⁶. According to data from the Ministry of Health, 32,701 new cases of HIV and 29,917 cases of AIDS were diagnosed in 2020, with a detection rate of 14.1/per 100,000 inhabitants. In the 10-19 age group, the number of cases was 824 new cases of HIV and 332 cases of AIDS⁴.

Furthermore, advances in diagnostic and therapeutic technologies, which have impacted child and adolescent morbidity and mortality, have allowed children infected by mother-to-child transmission in the past decade to be treated as adolescents, as well as new cases of adolescents infected by HIV through other transmissions routes^{4,7-10}. Therefore, there is a trend toward juvenilization of the infected population, and this population needs to be included in epidemiological research studies^{2,3,8-10}.

Considering the relevance and magnitude of HIV/AIDS in youth, the objective is to analyze the epidemiological profile of adolescents with reported cases of HIV/AIDS in Espírito Santo, Brazil.

METHODS

Study design

This is a descriptive, cross-sectional study with secondary databases.

Place and period of the study

The data collected refer to the State of Espírito Santo residents from 2010 to 2020.

Study population and eligibility criteria

It encompasses adolescents living with HIV/AIDS in the age group of 13 to 19 years, of both sexes, who reside in the State of Espírito Santo.

Data collection

We analyzed HIV/AIDS notifications registered in the Information System of Notifiable Diseases (Sistema de Informação de Agravos de Notificação - SINAN), Laboratory Examination Information System (Sistema de Informação de Exames Laboratoriais - SISCEL), Medication Logistics Control System (Sistema de Controle Logístico de Medicamentos - SISCLM) and Mortality Information System (Sistema de Informação sobre Mortalidade - SIM).

Data analysis

The study variables were grouped into: sociodemographic (age group, sex, race/colour, education, municipality of residence), epidemiological (probable mode of transmission), and clinical/laboratory (date of diagnosis, exposure category, viral load tests, and year of death). Descriptive analysis was performed, including frequency distribution for qualitative variables and mean calculation for quantitative variables. Simple mapping of health events was used for spatial analysis methods; exploratory analysis was employed to describe geographical distribution patterns.

RESULTS

Between 2010 and 2020, in the State of Espírito Santo, 523 cases of HIV/AIDS were reported among adolescents aged 13 to 19 years, making an average of 47 cases per year. A higher occurrence of cases was observed in males (68.8%); they are older (mean=18.0 years), and a few of them (4.2%) are in the age group 13 to 15 years. The race/colour brown predominated in both sexes. However, the girls' education is lower, with 47.2% being in elementary school, while 45% of the boys are in high school.

Among the exposure category, differences between genders can also be observed, where most female adolescents identify themselves as heterosexual (82.2%) and in males, those who recognize themselves as homosexual (55.0%) predominate.

Table 1 shows the reported adolescents' distribution according to sociodemographic characteristics and exposure category.

Table 1: Distribution of HIV/AIDS cases (n=523) by sex, according to age group, race/colour, education, and exposure category, from 2010 to 2020, in the state of Espírito Santo – Brazil.

Variables	Sex	
	Female (%)	Male (%)
Age group		
13 to 15 years	26 (16.0)	15 (4.2)
16 to 18 years	89 (54.6)	174 (48.3)
19 years	48 (29.4)	171 (47.5)
Race/colour		
White	25 (15.3)	88 (24.4)
Black	24 (14.7)	42 (11.7)
Brown	89 (54.6)	156 (43.3)
Other	2 (1.2)	4 (1.1)
Ignored	23 (14.1)	70 (19.4)
Education		
Elementary	77 (47.2)	74 (20.6)
Middle	43 (26.4)	162 (45.0)
Higher	1 (0.6)	33 (9.2)
Ignored	42 (25.8)	91 (25.3)
Exposure category		
Homosexual	1 (0.6)	198 (55.0)
Bisexual	1 (0.6)	42 (11.7)
Heterosexual	134 (82.2)	52 (14.4)
Vertical transmission	8 (4.9)	7 (1.9)
Ignored	19 (11.7)	61 (16.9)
Total	163 (31.2)	360 (68.8)

Source: SINAN/SISCEL/SISCLM.

The data collected show a linear growth trend in HIV cases, especially from 2011 onwards, although between 2019 and 2020, there was a sharp drop. AIDS cases ranged from 8 (2010) to 22 cases (in the years 2011 and 2014), with a decreasing trend (figure 1). Of the 161 AIDS cases analyzed in this research, 6.8% (n=11) evolved to death.

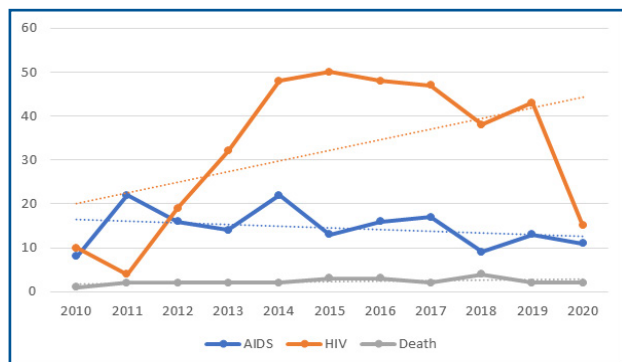


Figure 1: Year of diagnosis of HIV cases (n=354) and AIDS (n=161) in adolescents (13 to 19 years) and number of deaths, period 2010 to 2020, in the state of Espírito Santo – Brazil.

Source: SINAN/SISCEL/SISCLM/SIM.

Figure 2 shows the geographical distribution of HIV/AIDS cases by municipalities of residence from 2010 to 2020 in Espírito Santo. The HIV/AIDS cases occur in all regions of the state of Espírito Santo, being more concentrated in the coastal region, especially near the state capital, in the municipalities of Vila Velha (19.9%), Serra (15.9%), Vitória (14.0%), and Cariacica (12.0%).

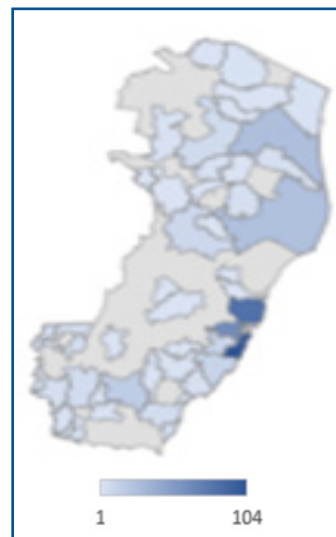


Figure 2: Geographic distribution of HIV/AIDS cases (n=523) by municipalities of residence, from 2010 to 2020, in the State of Espírito Santo - Brazil

Source: SINAN/SISCEL/SISCLM.

Regarding the transmission route, the youngest adolescents under 15 contracted HIV via a vertical transmission (36.4%). On the other hand, above 16 years of age, sexual transmission occurred in more than 90% of the cases. In the viral load test, HIV was detectable in 100% of the vertical transmission cases and almost 80% of the sexual transmission cases. In addition, we observed a large number of cases in which the type of transmission was ignored (table 2).

Table 2: Distribution of AIDS cases (n=164) by route of transmission, according to age group and viral load, from 2010 to 2020, in the state of Espírito Santo – Brazil.

Variables	Type of transmission		
	Vertical (%)	Sexual (%)	Ignored (%)
Age group			
13 to 15 anos	4 (36.4)	10 (9.6)	4 (8.2)
16 to 19 anos	7 (63.6)	94 (90.4)	45 (91.8)
Viral load			
Detectable	11 (100.0)	81 (77.9)	36 (73.5)
Undetectable	0	13 (12.5)	10 (20.4)
Ignored	0	10 (9.6)	3 (6.1)
Total	11 (6.7)	104 (63.4)	49 (29.9)

Source: SINAN/SISCEL/SISCLM.

DISCUSSION

From 2010 to 2020, in Espírito Santo, we observed a higher frequency of HIV/AIDS cases in male adolescents older than 16 years, of mixed race/colour, who were in high school. The most frequent route of infection was the sexual, homosexual relationship. The HIV viral load of these adolescents was detectable in almost all cases, and eleven died due to AIDS complications.

In Brazil, this increasing AIDS detection rate trend was also observed in the 15 to 19-year-old male age group (29%) between 2010 and 2020. This age group was the only one to show an increase in detection rates among males and, in 2020, had a higher detection rate than females⁴. This epidemiological profile has also been found in other studies, and the main route of HIV transmission among adolescents over 16 years old was unprotected sexual intercourse^{1,4,7,8,11,12}.

One of the explanations found in the literature is that older adolescents tend to have more partners, successive or simultaneous, and get involved in unstable relationships, where sexual relations are not always protected^{3,7,12}. As additional elements, one can consider the lack of knowledge and disbelief in the use of condoms^{3,7}; the recognition of being invulnerable, even after unprotected sexual relations^{3,12}; and the inconsistency between discourse and practice of HIV/AIDS prevention^{3,12-16}.

Regarding the exposure category, we observed a predominance of the homosexual category among men and heterosexual among women, corroborating other studies^{1,4,12}. The first social representations of AIDS, where the HIV was specific to the homosexual “risk group”, sex workers, and many others associated with the absence of safe sex practices, have led heterosexual men and women to have a lower perception that their sexual orientation does not give them protection against HIV^{13,15,16}.

Concerning self-reported race/colour, in this study, brown race/colour was predominant. This variable “race/colour” is relevant for tracing the epidemiological profile, not being significant in the relationship with safe sex practice¹⁷. Regarding education, this study observed differences in the proportions of cases according to sex: reported cases of AIDS in males had a higher education level than in females. Data are similar to the national profile of cases reported in 2020, where 41.1% of male adolescents had completed high school, while in females, this same group represented 26.5%⁴.

The level of education has great relevance for adolescents living with HIV/AIDS because those with higher education levels seek more information about the disease and adhere better to antiretroviral treatment¹⁸. However, it is noteworthy that the proportion of notifications without information on education remains high in both genders: 25.8% among women and 25.3% among men, and this gap hinders data interpretation.

The spatial distribution of HIV/AIDS among adolescents showed that the highest prevalence rates were concentrated in the metropolitan region of large urban centres. The trend toward convergence in large urban centres probably occurs because these places have a better health sector and host most of the Testing and Counseling Centers (Centro de Testagem e Aconselhamento - CTA)

and Specialized Care Services (Serviços de Atendimento Especializados - SAE), in addition to the strategic spatial location, which favours the displacement of these young people in search of services¹².

When analyzing the number of HIV and AIDS cases from 2010 to 2020, a sharp drop was observed between 2019 and 2020. According to the Ministry of Health, this decrease in AIDS cases in almost the entire country may be related to the underreporting of cases due to the overload of health services during the pandemic of COVID-19⁴.

Although AIDS has been on the National Compulsory Notification List since 1986, the notification of HIV infection cases became mandatory only in 2014¹⁹. For this reason, the expressive increase in HIV cases from then on was observed in this study. The trend of increasing HIV cases until 2019, seen in this study, is a peculiar characteristic of this age group¹². According to data from the Ministry of Health (2021), there was a 29.0% increase in HIV cases in the 15-29 age group⁴. On the other hand, AIDS cases between 2010 and 2020 showed stability with a tendency to decrease, probably due to the benefits of Antiretroviral Therapy (ART).

Another fact observed in this study was the high percentage of detectable viral load among adolescents, regardless of the route of infection. These results suggest that adolescents must adhere to the recommended treatment, which, according to the national protocol, should be started early, even in asymptomatic individuals²⁰.

From these data, it is clear that the 523 adolescents in the study were not correctly taking antiretroviral drugs because these medications reduce the HIV viral load in the circulating blood, which becomes undetectable²⁰.

According to the literature, low adherence among adolescents is associated with several reasons, such as complex treatment regimens with side effects; rigid schedules; changes in daily routines; fear of other people finding out about the diagnosis; recent occurrence of stressful events; diagnosis of depression; oppositional and rebellious attitudes when facing an inadequate diagnosis disclosure, or lack of knowledge about the diagnosis^{2,21-26}. In addition, without proper clinical/laboratory/medication follow-up, the immune system is compromised and susceptible to opportunistic diseases, which can lead the adolescent to death²⁰.

In this study, 11 (6.8%) of the adolescents who reported having AIDS died. Mortality due to AIDS among adolescents is related to the fragility in early diagnosis of infection cases and to monitor the health status of this age group⁷. Moreover, it is essential to follow up on how the antiretroviral treatment is being carried out, monitoring the immunity and the effectiveness of the medication; this requires access to medication and health services²⁰.

In Brazil, antiretroviral drugs are distributed free of charge⁹. However, more than having access to medication, it is crucial that bonds be built among professionals, adolescents, and families to obtain safety and commitment to continued treatment to ensure a better quality of life for this adolescents⁷.

Finally, the limitations of this study include the use of a secondary database, which did not allow direct contact with the adolescents; there was also the presence of missing

or incomplete data, which made it difficult to interpret some of the results found. However, it is also noteworthy that data collected during the COVID-19 pandemic may have had repercussions on reducing reported cases of HIV/AIDS⁴.

The strong point of this survey was the high number of detectable viral loads, which points to failures in health services. The results show the importance of developing a public policy to improve adolescents' access to services, thus enabling earlier HIV diagnosis, better adherence and control of clinical parameters of these young people.

■ CONCLUSION

The epidemiological profile of HIV and AIDS cases among adolescents in the state of Espírito Santo shows a predominance of cases in males aged 16 to 19 years, with incomplete high school education, who acquired HIV through unprotected sex in homosexual relationships. In

addition, we highlight the high percentage of adolescents with detectable viral loads and the occurrence of deaths from AIDS complications.

Authors' contributions

Authors AEM, CBF and SFMS contributed to the project development, data collection and analysis, writing and review of the manuscript. Author MB contributed to the writing and reviewing of the manuscript.

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This work was carried out with the authors' resources.

Conflict of interest

The authors declare that they have no conflicting interests.

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Resumo

Introdução: A epidemia da AIDS passou por diversas transformações e, nos últimos anos, observa-se aumento de casos de HIV/AIDS entre adolescentes e jovens. Assim, é fundamental conhecer essa população para embasar cientificamente as ações em saúde.

Objetivo: analisar o perfil epidemiológico de adolescentes que vivem com HIV/AIDS no Estado do Espírito Santo, Brasil.

Método: estudo descritivo, seccional, no qual foram analisadas notificações de HIV/AIDS entre adolescentes de 13 a 19 anos, entre 2010 e 2020.

Resultados: foram encontrados 523 adolescentes vivendo com HIV/AIDS no período analisado (média de 47 casos/ano). Prevaleceu os adolescentes do sexo masculino (68,8%), com mais de 16 anos (média=18,0 anos), de raça/cor parda (54,6%), residentes na região metropolitana, próxima a capital. Foi observado que a escolaridade do sexo feminino é menor, estando 47,2% delas no ensino fundamental, enquanto 45,0% dos rapazes já estão no ensino médio. Em grande parte dos casos a infecção ocorreu via sexual, sendo, entre os homens, através de relações homossexuais (55,0%) e entre as mulheres por meio de relações heterossexuais (82,2%). A carga viral de HIV foi detectável em quase totalidade (84,8%) dos casos e 11 (6,8%) destes adolescentes evoluíram para óbito.

Conclusão: O perfil epidemiológico dos casos de HIV e AIDS, entre os adolescentes, no Estado do Espírito Santo, demonstra maior frequência de casos no sexo masculino, na faixa etária de 16 a 19 anos, com ensino médio incompleto, que adquiriram HIV por via sexual desprotegida, em relações homossexuais. Destaca-se a alta porcentagem de jovens com carga viral detectável e os óbitos em decorrência de complicações da AIDS.

Palavras-chave: Adolescente; HIV; síndrome de imunodeficiência adquirida (AIDS); perfil de saúde.

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