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Short Communication

HIV/AIDS in small cities in Midwest Santa Catarina, south of Brazil: Clinical and epidemiological aspects, opportunistic infections.

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Abstract

Introduction: We avaluated the clinical features, epidemiology, opportunistic infections and coinfections of HIV/AIDS patients. **Methods:** We analyzed the records of 143 patients receiving antiretroviral therapy at a public center in the Midwest of Santa Catarina, south of Brazil, from December 2014 to September 2015. **Results:** Most were male, Caucasian, married, with low education level, and aged 31–50 years. Heterosexual transmission was the most common infection route. Regarding coinfection, 3.5% had hepatitis C, 2.1% hepatitis B, 4.2% syphilis, and 4.9% tuberculosis; 38.5% had opportunistic infections. **Conclusions:** HIV infection follows the national trend, but hepatitis B and C coinfection rates were higher, while tuberculosis rate was lower.

Keywords: HIV. AIDS. Coinfection. Opportunistic infection.

Epidemic of the acquired immunodeficiency syndrome (AIDS) has greatly changed over the years, with an increasing number of cases in small cities and with less educated populations[1]. As the targets the immune system, the consequence of infection is a great depletion of defense cells, facilitating the emergence of opportunistic infections that complicate the evolution of seropositive patients. There are small geographic variations, but in general, the most common infections affect the respiratory tract, the gastrointestinal tract, and the nervous system. Highly active antiretroviral therapy can suppress the viral replication with a consequent recovery of the immune system and a decrease in opportunistic infection incidence. Consequently, mortality rates have decreased significantly, and AIDS has started to be considered a chronic disease.

Nevertheless, these infections remain the greatest cause of hospitalization and death among AIDS patients, probably due to the delayed diagnosis and consequent immune system failure. Due to the epidemiological diversity observed in the different regions of Brazil, HIV/AIDS studies are important to determine public policies directed toward the regional necessities.

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The number of hepatitis B and C cases has been increasing among seropositive patients and tuberculosis is the main cause of death when associated with HIV. Syphilis occurrence among HIV/AIDS patients suggests that, even after being infected, these patients continue to have unprotected sexual intercourse.

This study evaluated the clinical and epidemiological aspects of HIV/AIDS and its opportunistic infections and coinfections in seropositive patients in Midwest of Santa Catarina, south of Brazil.

This quantitative, exploratory, cross-sectional cohort study was conducted at a public health service unit in Joaçaba, a municipality in Midwest Santa Catarina State, from December 2014 to September 2015. Sociodemographic data, and information on registered opportunistic diseases and coinfections were collected from the records of seropositive patients at the Testing and Follow-Up Center (CTA) of Joaçaba. The cities that compose this region have a population of 134,638 inhabitants.

Statistical analyses were performed using Fisher's exact test. The level of significance was set as 0.05 and Excel from the Microsoft Office 2010 pack and Statistica 7.0 were the computer software used.

Our results revealed that most of the 143 HIV/AIDS patients analyzed were male, aged 31–50 years (66.4%), Caucasian, married or in a steady relationship, and with low education level,

and 67.7% were independent or self-employed professionals. Most patients had a time to diagnosis of 5–10 years, and all of them were on antiretroviral therapy. Heterosexual intercourse was the most common infection route.

The occurrence of opportunistic infections was registered in 55 (38.5%) patients **(Table 1)** and 67.5% of individuals with CD4 count < 200 cells/mm^3 showed this infection, while 20.2% of those with CD4 count > 200 cells/mm^3 developed it. This difference was significantly higher (p=0.05).

Regarding coinfections, the occurrence of hepatitis C, hepatitis B, syphilis, and tuberculosis was registered in 21 patients (14.7%). **Table 2** shows the absolute and relative frequencies of each condition.

The predominance of males detected in this study was also observed in other studies[2]. Furthermore, the prevalent age group in this study (30–50 years) was consistent with the data from the Ministry of Health[3] and other studies conducted in Brazil[2].

The predominance of Caucasian patients (75.5%) can be attributed to the migration of Italian and German individuals to Western Santa Catarina. A similar finding was reported in Tubarão, Southern Santa Catarina[2].

In our study, 58% of patients were married or had a steady relationship and this status may have influenced the epidemic, since discordant couples and seropositive pregnant women require more care from health professionals to prevent vertical transmission and infection of their partners.

Additionally, the low education level of infected patients in Midwestern Santa Catarina seems to reflect a reality in the state. Such a situation is alarming as patients with low education level have a poorer understanding of their disease and treatment, which tends to facilitate viral dissemination and hinder treatment compliance.

In our study, 66.4% of patients were part of the labor market (only 6.3% were unemployed), which is higher than that reported in Brazil among patients on antiretroviral therapy (44.9% of men and 38.1% of women were employed)[4]. Regarding the mode of transmission, in Brazil, sexual transmission has been the main route of infection[2], and in most cities with a population of ≤50,000 inhabitants, heterosexual contact is predominant[1], as shown in this study, but should be carefully considered as suggested by Uribe-Salas et al. (2005) who detected changes in prior information[5]. In our study, all HIV/AIDS patients were on antiretroviral medication provided by the CTA, following the 2013 Clinical Trial Protocol and Therapeutic Guidelines for HIV Infection Management in Adults, published by the Ministry of Health[6]. According to the US National Institutes of Health (NIH), initiating antiretroviral therapy early significantly reduces the occurrence of both opportunistic infections and other complications unrelated to AIDS, such as cardiovascular, hepatic, and renal diseases[7]. Here, all patients were on antiretroviral therapy, and 66.5% of them had an increase in CD4 count in the last examination performed.

Currently, the major risk of death in HIV patients is the occurrence of opportunistic infections. Their incidence varies geographically, but candidiasis, pneumonia, herpes, and toxoplasmosis are most prevalent[8], similar to those found in the patient records in Joaçaba, wherein herpes zoster, moniliasis (oral and esophageal), pneumonia, diarrhea, and cerebral toxoplasmosis were present in 55 patients (38.5%). In the city of Itumbiara, Goiás, this prevalence was 34.5%[9]. Therefore,

TABLE 1: Absolute and relative frequencies of opportunistic infections registered in the clinical records of 143 HIV/AIDS patients assisted at the Testing and Follow-Up Center in Joaçaba, Santa Catarina, from December 2014 to September 2015.

Opportunistic infections	No.	%
Cytomegalovirus	3	2.1
Diarrhea	8	5.6
Genital herpes	2	1.4
Herpes zoster	12	8.4
Skin lesions	6	4.2
Hodgkin's lymphoma	1	0.7
Non-Hodgkin lymphoma	1	0.7
Esophageal moniliasis	4	2.8
Oral moniliasis	5	3.5
Neurotoxoplasmosis	6	4.2
Pneumonia	8	5.6
Other	7	4.9

Note: Some patients had more than one opportunistic infection.

TABLE 2: Absolute and relative frequencies of coinfections registered in the clinical records of 143 HIV/AIDS patients assisted at the Testing and Follow-Up Center in Joaçaba, Santa Catarina, from December 2014 to September 2015.

Coinfection	No.	%
Hepatitis B	3	2.1
Hepatitis C	5	3.5
Syphilis	6	4.2
Tuberculosis	7	4.9
Without coinfections	122	85.4
Total	**143**	**100.00**

in developing countries, the etiological diagnosis often cannot be confirmed due to lack of appropriate tools, which also occurred in this study. In many studies, there was no reference to laboratory tests or established treatment.

Regarding CD4 counts, in this study, opportunistic infection incidence was significantly higher in patients with CD4 counts of <200 cells/mm^3. This was also observed in a study conducted in the United States to assess diagnosed opportunistic infections between 1994 and 2007[10] .

The hepatitis coinfection rates vary in different regions of the country[11]. In our study, hepatitis C was registered in 3.5%, and hepatitis B in 2.1%. In the University Hospital of Florianópolis, Santa Catarina, total hepatitis B surface antigen and total hepatitis B core antibody showed positive results in 2.3% of seropositive patients[12]. According to data from the Ministry of Health, most of the notified cases of hepatitis B and C are concentrated in the southeastern region, followed by the southern region[13].

A worldwide increase in the number of syphilis cases, including in Brazil, has been reported[14]. In the region covered in this study, we have long been observing such an increase in primary health care settings. For this reason, we found six patients (4.2%) with positive serology results for syphilis in the clinical records of seropositive patients. In a study conducted in Rio de Janeiro, the prevalence of this infection among 830 seropositive patients assisted at a medical clinic for HIV/AIDS was 2.7%. Importantly, 73% of the patients with syphilis in that study had already been treated and were reinfected, which shows that despite being HIV-positive, these patients continued to have unprotected intercourse[4].

In addition, the use of indicators to confront the disease load of tuberculosis in Santa Catarina showed high heterogeneity in its distribution, with the Midwest being one of the areas with a lower infection load[15]. In our study, seven patients (4.9%) were diagnosed with tuberculosis similar to those of the Ministry of Health, where tuberculosis in Midwest Santa Catarina has low prevalence when compared to other areas of the state and from Brazil. The presence of a small urban agglomeration in Joaçaba and better housing conditions than in the major urban centers could explain the low prevalence of this infection.

Following the national trend, HIV infection in Midwestern Santa Catarina was more common among patients who were male, Caucasian, married and/or in a steady relationship, and with low education level. Many HIV/AIDS patients were probably unaware of infection prevention measures as the most common mode of transmission was heterosexual, which suggests unprotected sexual activity. This is corroborated by the prevalence of other sexually transmitted infections in the sample, such as syphilis and hepatitis. Meanwhile, the number of patients coinfected with tuberculosis was relatively low, while the detected opportunistic infections corresponded to the national standard.

Despite the excellent structure available to assist patients at the CTA, with all of them being treated, possible limiting factors may have occurred in this study, such as under-notification, non-inclusion of all coinfection and opportunistic infection diagnoses in clinical records, and operational difficulties in laboratory diagnosis in the region.

Finding some clinical and epidemiological data, similar or not to those referred to in major urban agglomerations, such as therapeutic response and presence of opportunistic infections and coinfection, suggests that similar studies should be conducted in regions of low population density within Brazil to promote appropriate planning of public policies of HIV/AIDS control.

Ethical considerations

This study was approved by the Ethics Committee for Human Research, University of Midwest of Santa Catarina, Joaçaba/SC (protocol number 916.863).

Conflict of Interest

The authors declare that there is no conflict of interest.

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