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CO-INFECTION IN HIV/AIDS-BEARING PEOPLE FROM A SPECIALIZED CARE SERVICE OF THE INTERIOR REGION OF *MARANHÃO* STATE

Coinfecção em portadores de HIV/AIDS de um serviço de atendimento especializado do interior maranhense

La coinfección con el VIH/SIDA portadores de un servicio de atención especializada de interior maranhense

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ABSTRACT

Objective: The study's purpose has been to characterize the occurrence of co-infections in HIV patients from a Specialized Care Service of the interior region of *Maranhão* State. **Methods:** It is a field survey with a quantitative approach, being a cross-sectional, retrospective and documentary type, consisting of 390 medical records comprised between 2005 and 2014, which were analyzed through the statistical program SPSS 21.0. **Results:** The most prevalent co-infections were skin and mucosal diseases, persistent non-specific dermatitis 41 (14.6%), oral candidiasis 32 (11.4%) and scabies 27 (9.7%). Such co-infections have appeared up to three years after diagnosis of HIV, when CD4 and viral load levels in people living with HIV/AIDS had a viral load lower than 10,000 mm³, and CD4 of 200 to 499 mm³. **Conclusion:** The appearance of co-infections is closely related to those with a low level of schooling, furthermore, almost 100% of patients acquired another infection up to three years after diagnosis of HIV.
Descriptors: HIV, SEXUALLY TRANSMITTED INFECTIONS, CO-INFECTION.

RESUMO

Objetivo: Caracterizar a ocorrência de coinfecções em portadores de HIV em um Serviço de Atendimento Especializado do Interior maranhense. **Metódos:** Pesquisa de campo, quantitativa, transversal, retrospectiva e do tipo documental, constituída por 390 prontuários compreendidos no período de 2005 a 2014, analisados através do programa estatístico SPSS 21.0. **Resultados:** As coinfecções mais prevalentes foram às doenças que atingem pele e mucosas, dermatite persistente inespecífica 41 (14,6%), candidíase oral 32 (11,4%) e escabiose 27 (9,7%), cujo aparecimento ocorre em até três anos após diagnostico de HIV, quando os níveis de CD4 e carga viral nas PVHA apresentaram carga viral menor que 10.000mm³ e CD4 de 200 a 499mm³.**Conclusão:** O aparecimento das coinfecções está intimamente

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ligado àquelas pessoas com baixo nível de escolaridade e quase 100% dos pacientes adquiriram outra infecção com até três anos após diagnostico de HIV.

RESUMEN

Objetivo: Para caracterizar la presencia de coinfección en los portadores del VIH en un servicio especializado de maranhense interior. **Métodos:** La investigación de campo, en sección transversal, de tipo retrospectivo y documental cuantitativa, que consta de 390 registros médicos dentro de un período de 2005 a 2014, analizó con el programa SPSS 21.0. **Resultados:** Los co-infecciones más prevalentes fueron las enfermedades que afectan a la piel y, dermatitis persistente mucosa inespecífica 41 (14,6%), la candidiasis oral, 32 (11,4%) y la sarna 27 (9,7%), cuya aparición se presenta en hasta tres años después del diagnóstico de VIH cuando los niveles de CD4 y la carga viral en las PVVS tuvieron una menor carga viral y CD4 10.000mm³ 200 a 499mm³.**Conclusão:** la aparición de coinfecciones está estrechamente ligada a aquellas personas con bajos niveles de educación y casi el 100 % de los pacientes adquirió otra infección con hasta tres años después del diagnóstico de VIH.

INTRODUCTION

The Human Immunodeficiency Virus (HIV) belongs to the class of retroviruses, the family Retroviridae, subfamily *Lentiviridae* (*lentivirus*), which in turn, causes human infection, which can lead the HIV patient to Acquired Immunodeficiency Syndrome (AIDS).[1]

HIV is a Sexually Transmitted Infection (STI), and it is among the most common public health problems in Brazil and around the world. Having any STI increases the individual's exposure to HIV infection, increasing on average 18 times the risk of an individual getting HIV, likewise an HIV-positive person, also bearing a STI, increases the degree of transmission of that virus to a healthy person.[2,3]

The timely diagnosis, the use of the drug therapy provided by the *Sistema Único de Saúde (SUS)* [Brazilian Unified Health System], and the adequate clinical follow-up, not only increased the life expectancy, but also the quality of life of people living with HIV/AIDS.[4]

Despite the use of drug therapy, People Living With HIV/AIDS (PLWHA) become vulnerable to other infections, the most frequent ones in this group in Brazil are as follows: hepatitis B and C and tuberculosis together represent one of the main causes of death among people infected with HIV. Other diseases that usually appear are the human T-lymphotropic virus and syphilis.[4]

In regards to the transmission of HIV and the causative agents of other STIs are not random, it is related to the modes of interaction and beliefs of different population groups, in addition to the individual, local and personal factors, determining in part the individual's vulnerability to exposure HIV/AIDS and other STIs.[5]

HIV carriers are prone to numerous co-infections, which may appear to be more prevalent. It is undeniable that the AIDS epidemic has brought a distinct demand for health professionals, since they need to deal not only with patient care, but also with learning to deal with the human being in their most intimate issues. Requiring new reflections on the health care model and the definition of prevention actions at the different levels of *SUS* management.[5]

Three decades after the first reports of AIDS cases resulting from HIV infection, there are changes in the profile of patients affected and the appearance of co-infections. This scenario of clinical and epidemiological changes establishes new challenges for professionals involved in the care practice.[4] Hence, this study aimed to to characterize the occurrence of co-infections in HIV patients from a Specialized Care Service of the interior region of *Maranhão* State.

METHODS

It is a descriptive research with a quantitative approach. The descriptive character consists in the description of facts and phenomena meticulously, using a questionnaire as an instrument for the collection of data.[6] It is a cross-sectional, retrospective research of documentary type, that has a survey of documents as a basis, becoming a valuable technique of data collection, the information is carried out on materials that have not received any type of critical analysis, such as medical records.[7]

The research was carried out in a Referral Center, the Specialized Care Service, located in *Caxias* city, *Maranhão* State. Only data from HIV-positive diagnosed cases from 2005 to 2014 were used as data collection criteria. Exclusion criteria were seropositive patients by vertical transmission, and medical records with incomplete data.

The basic instrument used in the data collection was adapted from the *Sistema de Informações de Agravos de Notificação (SINAN)* [Information System of Notification Aggravations] notification sheet, used by the health professionals of the Counseling and Testing Center (CTC). The data collection period began in November 2015 and was completed in March 2016. After application of the inclusion criteria, only 390 medical records filled the same.

The collected data were analyzed with the aid of the statistical software SPSS 21.0 (Statistical Package for the Social Sciences), academic version. The variables were described in terms of absolute and relative values. In order to verify the association between the categorical variables, the Pearson chi-square test was used, considering a 95% confidence level, where the results were considered statistically significant if $p<0.05$.

The project was submitted to the Research Ethics Committee from the *Universidade Estadual do Maranhão (UEMA)*, through the *Centro de Estudos Superiores de Caxias (CESC)*, aiming to assess compliance with the ethical and legal principles of the research in accordance with the Resolution No. 466/2012, being approved through the approval number 42341014.1.0000.5554.

RESULTS AND DISCUSSION

Sociodemographic profile of people living with HIV/AIDS

Given the demographic partner data obtained from the instrument, it was possible to outline the profile of people living with HIV. 199 (51%) of PLWHA are males, 178 (45.6%) females, it is observed that there was no significant difference in relation to gender, thus following a national characteristic, evidencing a phenomenon denominated "feminization".[8]

It is not different, once the diagnosed cases of HIV in Brazil have been analyzed, making a cut in the last 10 years, it is evident the progressive increase of women diagnosed with HIV.[9] This scenario of gender approximation regarding the diagnosis of HIV is present in many epidemiological studies present in literature.[10-2]

Taking into account the distribution of HIV cases by region of residence; rural, urban and other localities also followed the evolution of the epidemic in the country. In the *Caxias* city, *Maranhão* State, where the research was carried out, the number of people diagnosed with HIV is significantly higher in the urban area 161 (41.3%) compared to rural 42 (10.8%). The epidemiological bulletin reveals this profile in the National scenario of more HIV cases in the more urbanized and populous regions.[9]

They also add to the sociodemographic profile, of the residents in other localities, adjacent cities (smaller and less populous) to *Caxias*, appearing with 187 (47.9%). Expected values, since *Caxias* is a referral center for HIV diagnosis and treatment, evidencing the internalization or ruralization aspect of the epidemic. Thus, the internalization process of AIDS comprises several aspects, among them the tendency of spread of the epidemic, from the greater urban centers, to other regions; if this, verified in the present research.[13]

Subsequently, relating to race/color, it was observed that, among the cases registered in the last 10 years (2005 to 2014), the brown skin color 213 (54.6%) followed immediately the black color 78 (20%). In Brazil, at the same time interval, there is a predominance of whites, followed by browns and blacks,[9] disagreeing with the results found in the present research, but, on the other hand, agrees with another important survey recently carried out in the *Maranhão* State,[14] where by considering race/color element, the most frequent classification was of brown individuals, yet it justified that the different result with the general data of Brazil is due to the strong miscegenation in *Maranhão*, expecting the predominance of brown over the others, strengthening the results found in this research.

It is also important to address the unrecorded color cases, a relatively high index in which the color was ignored 49 (12.6%), where this circumstance reflects the same found by other authors.[15-6]

Another characteristic to be addressed is the distribution of secondary education, where it is observed that the percentage of PLWHA that did not complete elementary school corresponds to 156 (40%), illiterate with 56 (14.4%). Only 9 (3%) achieved higher education. The degree of schooling[8] is an indicator that correlates with socioeconomic variables, thus, they consider the existence of a tendency of this high index of individuals with a lower level of education an indicative of the irradiation of the epidemic the less favored strata of society, described by many as pauperization.[17-8] According to age, there was an average of 34.64 years, an average also found in other studies.[16-9]

Prevalence of co-infection in people living with HIV/AIDS

Table 1 shows the distribution of co-infections found in the PLWHA group that are assisted in the CTC in *Caxias* city, *Maranhão* State, over the period from 2005 to 2014, then highlighting the most prevalent ones found through this research.

Table 1 - Distribution of the co-infections frequencies. *Caxias* city, *Maranhão* State, 2005 to 2014.

	n	%
Disseminated/extrapulmonary/ non-cavitary tuberculosis	1	0.4
Tuberculosis	**17**	**6.1**
Pneumonia	8	2.9
Leprosy	5	1.8
Syphilis	**27**	**9.7**
HPV	4	1.4
Herpes zoster	**10**	**3.6**
Cerebral toxoplasmosis	**10**	**3.6**
Toxoplasmosis	2	0.7
Visceral leishmaniasis	**15**	**5.4**
Cutaneous leishmaniasis	2	0.7
Hepatitis C	3	1.1
Hepatitis B	1	0.4
Persistent non-specific dermatitis	**41**	**14.6**
Scabies	**27**	**9.7**
Candidiasis	3	1.1
Oral candidiasis	**32**	**11.4**
Esophageal candidiasis	8	2.9
Giardiasis	4	1.4
Lactobacillus sp	5	1.8
Amebiasis	**18**	**6.5**
Others	**36**	**12.8**

Pesquisa direta, 2016

Concerning the 390 medical records analyzed, the most prevalent co-infections are diseases that affect the skin and mucous membranes. The spectra of the mucocutaneous manifestations include infectious (viral, fungal and bacterial), among them, persistent non-specific dermatitis 41 (14.6%), oral candidiasis 32 (11.4%) and scabies 27 (9.7%). Researchers have found similar results in their research. Dermatitis, candidiasis and scabies appear in the majority of patients with HIV.[20] In a similar analysis, the dermatoses in PLWHA appear atypical in most patients, determining the introduction for a precise and well-designed diagnosis according to the signs and symptoms, it still confirms that fungal dermatoses are the most frequent, followed by viral infections in HIV patients.[21]

Herein, **Table 1** shows that bacterial infections such as Tuberculosis (TB) had an expressive number 17 (6.1%) differently from leprosy with only 1.8% of registered infections. Among the States in the Northeast, *Maranhão* has high TB/HIV rates, as evidenced by the results obtained in a study of great relevance, referring to cases diagnosed with HIV from 2001 to 2010, 39% had TB/HIV co-infection, in parallel, underscores the importance of implementing HIV testing for all people diagnosed with TB, allowing the identification of criteria for control and care.[22]

Syphilis, an STI, was the most prevalent among bacterial infestations with 27 (9.7%). The Ministry of Health is worrisome that this high incidence of syphilis, in addition to bringing complications such as neurosyphilis, increases the individual's exposure to acquiring HIV during unprotected sexual contact. Its prevalence is proven to be eight times higher in PLWHA compared to the non-HIV population.[23]

In the case of diseases caused by protozoa, HIV/cerebral toxoplasmosis co-infection 10 (3.6%), HIV/visceral Leishmaniasis with a percentage of 15 (5.4%) and amebiasis 18 (6.5%) were the most common appeared. In a survey conducted by Fiocruz in a database, it reveals the high rate of HIV/Leishmaniasis co-infection, and the progressive increase in diagnosed cases, further corroborates that cases are more concentrated in the North and Northeast regions.[24] The Ministry of Health affirms this The rise of leishmaniasis/HIV is not only in Brazil, but globally, this is due to the expansion of leishmaniasis to urban centers and at the same time the internalization of HIV/AIDS.[25]

Another important parasitosis that mainly worries the immunosuppressed is the cerebral toxoplasmosis; a percentage of 3.6% was obtained, and like syphilis, they can cause neurological lesions. The Ministry of Health reports the difficulty of diagnosis for this pathology, due to its IGg serological markers, which is most often positive but of little use for diagnosis, and it is therefore recommended that all PLWHA that present compatible clinical signs and examination of image suggestive of neurotoxoplasmosis are treated empirically for this infection.[23]

On the other hand, the viral infections in PLWHA assisted by the CTC in *Caxias* city were less prevalent compared to the other infestations found in this study, hepatitis B and C, 1 (0.4) and 3 (1.1%) respectively. Nevertheless, these viral infections prevent the reduction of morbidity and mortality, especially when most infected people are unaware of their carrier status, contributing to the perpetuation of the infection cycle. To aggravate, hepatitis C and B together with HIV share the same means of transmission, in which the main ones are sexual and parenteral, allowing greater cases of co-infections of hepatitis with HIV.[26-5]

The Human Papillomavirus (HPV), a sexually transmitted infection, accounted for 1.4% of the co-infections found. In a literature review[28] with a high degree of evidence, the increase in HPV cases in PLWHA, the increase mainly among women. It is possible to notice in **Table 2** that the cases were the same for man and woman 2:2. This increases the concern that it is proven that HPV in women increases their chances of developing cancer, further exacerbating their health status.[23]

Herpes zoster was the most prevalent, within viral infections, 10 (3.6%). The manifestation of varicella zoster at some point in the course of HIV infection is frequent, but may be a sign of progression to AIDS, in this study conducted by Fiocruz, patients who developed varicella zoster were using HIV drug therapy, assuming infection acquired concomitant with HIV.[27] The other infections found were furunculosis, pityriasis, psoriasis, urinary tract infection, *triconoma vaginallis*, *entamoeba colli*, chancroid, neurosyphilis.

Association of the sociodemographic profile with the co-infection appearance

Sex-related co-infections are also present and, by taking a close look, some diseases such as tuberculosis 10 (6.4%), leprosy 4 (2.6%) and syphilis 14 (9.0%) leishmaniasis visceral 12 (7.7%), non-specific dermatitis 26 (16.7%), scabies 16 (10.3%) were evidently more predominant for males as shown in **Table 2**.

Table 2 - Distribution of the co-infections according to gender (390). *Caxias* city, *Maranhão* State, 2005 to 2014.

	Male		Female		*p*-value
	n	%	n	%	
Co-infection					0.114*
Disseminated/ extrapulmonary/ non-cavitary tuberculosis	1	0.6	0	0.0	
Tuberculosis	9	5.8	8	7.0	
Pneumonia	2	1.3	5	4.3	
Leprosy	4	2.6	1	0.9	
Syphilis	**14**	**9.0**	**12**	**10.4**	
HPV	2	1.3	2	1.7	
Herpes zoster	4	2.6	5	4.3	
Cerebral toxoplasmosis	**2**	**1.3**	**7**	**6.1**	
Toxoplasmosis	2	1.3	0	0.0	
Visceral leishmaniasis	**12**	**7.7**	**3**	**2.6**	
Cutaneous leishmaniasis	2	1.3	0	0.0	
Hepatitis C	2	1.3	1	0.9	
Hepatitis B	1	0.6	0	0.0	
Persistent non-specific dermatitis	**26**	**16.7**	**14**	**12.2**	
Scabies	**16**	**10.3**	**9**	**7.8**	
Candidiasis	1	0.6	2	1.7	
Oral candidiasis	**20**	**12.8**	**12**	**10.4**	
Esophageal candidiasis	6	3.8	2	1.7	
Giardiasis	1	0.6	3	2.6	
Lactobacillus SP	0	0.0	5	4.3	
Amebiasis	9	5.8	9	7.8	
Others	**20**	**12.8**	**15**	**13**	

*Pearson chi-square test, with 5% significance.

Moreover, by analyzing viral diseases, the HPV sexually transmitted infection had the same values for both sexes 2:2 (1.3 and 1.7%). A study[28] agrees with the fact that women represent a growing proportion in the AIDS epidemic, being infected at a much higher rate than men and now accounting for half of the HPV/HIV infected population.

On the other hand, even herpes zoster with a minimal difference predominated for females 5 (4.3%), while males only 4 (2.6%); also to cerebral toxoplasmosis, with a high rate of 7 (6.1%), compared to the opposite sex of only 2 (1.3%) of HIV co-infected/cerebral toxoplasmosis.

Generally, by exposing the distribution of co-infections (**Table 2**), it can be seen that most of the diseases found, whether AIDS-defining or not, are more present in male PLWHA, not different from the results published in the epidemiological bulletin, in the first six months of 2014, 9,913 (65.6%) cases of AIDS were reported in Brazil in males, and 5,204 (34.4%) in females. Similar to those found in this study in relation to the higher prevalence among males in reported cases.[29]

Table 3 - Distribution of the co-infections according to schooling. *Caxias* city, *Maranhão* State, 2005 to 2014 (390).

	Illiterate		Elementary school		High school		College		Overlooked		*p*-valor
	n	%	n	%	n	%	n	%	n	%	
Co-infection											0,1713*
Disseminated/extrapulmonary/ non-cavitary tuberculosis	0	0.0	1	0.7	0	0.0	0	0	0	0.0	
Tuberculosis	2	4.5	6	4.3	5	10.4	0	0	4	8.9	
Pneumonia	2	4.5	3	2.1	2	4.2	0	0	1	2.2	
Leprosy	1	2.3	3	2.1	1	2.1	0	0	0	0.0	
Syphilis	4	9.1	8	5.7	2	4.2	0	0	13	28.9	
HPV	0	0.0	3	2.1	1	2.1	0	0	0	0.0	
Herpes zoster	1	2.3	8	5.7	1	2.1	0	0	0	0.0	
Cerebral toxoplasmosis	1	2.3	3	2.1	4	8.3	0	0	2	4.4	
Toxoplasmosis	1	2.3	0	0.0	0	0.0	0	0	1	2.2	
Visceral leishmaniasis	1	2.3	5	3.5	3	6.3	0	0	6	13.3	
Cutaneous leishmaniasis	0	0.0	2	1.4	0	0.0	0	0	0	0.0	
Hepatitis C	1	2.3	1	0.7	0	0.0	0	0	1	2.2	
Hepatitis B	1	2.3	0	0.0	0	0.0	0	0	0	0.0	
Persistent non-specific dermatitis	2	4.5	28	19.9	7	14.6	0	0	4	8.9	
Scabies	4	9.1	14	9.9	6	12.5	1	100	2	4.4	
Candidiasis	0	0.0	3	2.1	0	0.0	0	0	0	0.0	
Oral candidiasis	5	11.4	15	10.6	8	16.7	0	0	4	8.9	
Esophageal candidiasis	1	2.3	3	2.1	3	6.3	0	0	1	2.2	
Giardiasis	2	4.5	2	1.4	0	0.0	0	0	0	0.0	
Lactobacillus sp	1	2.3	3	2.1	1	2.1	0	0	0	0.0	
Amebiasis	6	13.6	10	7.1	1	2.1	0	0	1	2.2	
Others	8	18.2	20	14.2	3	6.3	0	0	5	11.1	

* Pearson chi-square test, with 5% significance. Direct research, *Caxias*-2016

Referring to a conceptual framework, in a study of great importance carried out by Fiocruz, consistently shows that the onset of HIV and consequently opportunistic diseases in Brazil began in the social strata of higher education, with progressive social strata of lower schooling.[30]

With regards to co-infections and their distribution with educational levels, bacterial diseases such as tuberculosis, not being different, reached more people with elementary education 7 (5.0%). Leprosy was more homogeneous between the groups, however, just as most other diseases did not appear in people with higher education.

Syphilis bacterial and sexually transmitted disease was present in the group of illiterates with (9.1%), fundamental with (5.7%) and average level with 4.2%. Viral diseases, such as HPV, appeared only in elementary school 3 (2.1%) and high school 1 (2.1%). Similarly, Herpes zoster predominated in elementary education, 5.7%, while 0% in higher education, in addition to hepatitis 0% for secondary and higher education.

The group of diseases caused by parasitosis, only scabies reached all levels of education, however, predominating in the elementary school students with 14 (9.9%). Non-specific dermatitis also predominated in this same group 28 (19.9%).

These results reflect and evidence the high prevalence of co-infection in PLWHA, with a low level of schooling, most did not complete elementary school. Within this perspective, this situation represents, in summary, the influence of school

attendance. In other words, for him the degree of schooling is directly associated with the social place occupied by the individual in the class structure, in other words, his living conditions. Given the aforesaid perspective, it is easy to associate the current panorama, since for this author the degree of social vulnerability to acquiring diseases is greater.[31]

A general survey of this association (**Table 3**) reveals the prevalence of illness in the group of people who only reached elementary school and few those with higher education acquired any disease. Thus, it is translated that low level of schooling and a lower level of written language create barriers to access to information and tend to decrease the adherence of preventive practices, as well as the maintenance of preventive behaviors.

It is also important to briefly point out the data in which the schooling was disregarded. For instance, the number of people who acquired TB 4 (8.9) and syphilis of 13 (28.9%) with high rates. These ignored data make it difficult to accurately analyze the results, in addition to hindering the preventive actions carried out by the specialized service to specific groups.

Relative time of hiv diagnosis to co-infection symptom

The present study also consisted of knowing the relative time of HIV diagnosis for the appearance of the first co-infections. Therefore, it is possible to do this analysis through the results obtained in **Table 4**.

Table 4 - Distribution of the average time frequency to acquire a co-infection (167). *Caxias* city, *Maranhão* State.

Time	n	%
Up to 3	154	92.2
From 3 to 6	10	6.0
More 6	3	1.8

After scrutinizing the medical records, the time was estimated in three categories, and through representations (**Table 4**) a very high percentage is observed for the appearance of the first co-infections in up to 3 years, with 92.2%, that is, the patients after diagnosis of HIV-positive almost 100% of them acquire other infections within three years.

As already explored in this study, it was found that the highest prevalence was of infections that reach the skin and mucous membranes. So, taking an analogy with another research, in which he studied the dermatoses in PLWHA and the time for the appearance of these mucocutaneous infections, he realized that the time between the diagnosis of HIV infection and the presentation of the acne that motivated the consultation was up to three years, corroborating the findings in the present study.[32]

Following the analyzes, 6.0% of patients acquired their first infection 3 to 6 years after HIV diagnosis, the least significant were those who appeared with co-infection after 6 years or more, 3 (1.8%). This result is estimated to be due to the effectiveness of drug therapy since most were using it.

These results are difficult to make analogies and comparisons with other studies because there are few studies in Brazil about this relative time for the appearance of co-infections. However, there may be a relationship with the use of the medication and thereby decrease the vulnerability to other infections.

The exposed values took into consideration only the year of HIV diagnosis for the time of appearance of the first co-infections. Patients who acquired more than one co-infection in the same year were counted as only one since there was more than one co-infection in the same individual and in different years.

Co-infections associated with both CD4 and viral load levels

CD4 and viral load levels are one of the essential exams requested by health professionals accompanying PLWHA, from the HIV diagnosis and also throughout the treatment. Thus, it is relevant to know and relate these values with the presence of co-infection; these values are represented in **Table 5**. Recalling that CD4 and viral load levels were taken from the tests closest to the diagnosis of co-infection.

Table 5 - Distribution of the co-infections frequencies related to viral loads and CD4. *Caxias* city, *Maranhão* State.

	Viral		Bacterial		Protozoan		Other disease		*p*-value
	n	%	n	%	n	%	n	%	
Viral load									0.503*
From 10,000 to 1 million	5	29.4	11	22.9	18	27.7	18	18.6	
Less than 10,000	5	29.4	25	52.1	27	41.5	51	52.6	
Undetectable (< 50)	7	41.2	12	25.0	20	30.8	28	28.9	
CD4									0.276*
More than 500/mm^3	6	37.5	18	32.7	15	20.5	27	25.5	
From 200 to 499/mm^3	3	18.8	22	40.0	24	32.9	39	36.8	
Less than 200/mm^3	7	43.8	15	27.3	34	46.6	40	37.7	

* Pearson chi-square test, with 5% significance. The collection date was closest to the consultation.

Considering some diseases as a marker of progression to immunodeficiency and others related to HIV infection, analyzing by clustering of infectious diseases we can observe that: in viral diseases, it was possible to analyze that 41.2% of people with indices of undetectable viral load and CD4 lower than 200 mm³. There was no relationship of the significance of viral loads and CD4 levels to the appearance of viral co-infections.

Corroborating these findings,[32] a study compared CD4 levels to the appearance of skin infections caused by PLWHA viruses and 55.5% had a mean CD4 count of fewer than 350 cells/mm³. The most frequent diseases were HPV (16.0%), Herpes simplex (7.1%) and varicella zoster (1.4%).

The diseases caused by bacteria had a prevalence of 52.1% people with viral loads less than 10,000 cells/mm³ and with regard to CD4, 40% of PLWHA presented values between 200 and 499 mm³. This situation reflects the CD4 count higher than 350 cells/mm³ was present in 60.0% of those analyzed, and to further consolidate this analogy, one of the most prevalent diseases was the same as in this study, syphilis, in other words, the same disease with the same levels of CD4.[32]

Concerning the protozoan group, the most prevalent was 41% of the people had a viral load lower than 10,000 mm³ and 46.6% of the PLWHA had CD4 lower than 200 mm³ at the time of the diagnosis of parasite co-infection. Recalling that the most prevalent parasitoses were to toxoplasmosis and leishmaniasis and amebiasis.

The group of other diseases, the most prevalent were infections caused by fungi, particularly candidiasis, and it was the only group in which predominated CD4 lower than 200 mm³ 37.7% of people living with HIV/AIDS, 52.6% had viral load less than 10,000 mm³. When evaluating Candida infections in PLWHA, it was observed that the majority of the patients presented values greater than 500 cells/mm³ of CD4+ T lymphocytes, as well as undetectable viral load level, these results are positive compared to those found in this study, however the author emphasizes that 80% of them used some type of antiretroviral medication, contrary to the group in this study, in which the majority of the people who presented with candida had not yet begun drug therapy.[33]

Candidiasis had an average CD4 count of 258.7 cells/mm³, 61.5% were using Highly Active Antiretroviral Therapy (HAART) and the mean time of the HIV diagnosis was 6.0 years, reported surprising with the result, since this infection is more common in the early stages of HIV infection. Therefore, it reveals the importance of drug therapy for PLHIV and its adhesion, both for viral replication control and for a better quality of life. Taking a general analysis, the average levels of CD4 and viral loads, are between 200-499 mm³ and less than 10,000 mm³.[33]

FINAL CONSIDERATIONS

The results evidenced the high prevalence of co-infections, especially those affecting the skin and mucosa such as candidiasis 15.4%, persistent non-specific dermatitis 14.6%, and scabies 9.7%. These manifestations, especially candidiasis manifest atypical in HIV patients, serve as indicators of low immunity and disease progression, with this brings the importance of health team monitoring and, in essence, to have a differentiated view regarding these manifestations, to assist in more targeted assistance.

The appearance of co-infections is closely linked to those with low educational level, especially those who did not complete elementary school. The time of the diagnosis of HIV to the appearance of co-infections in PLWHA, a scarce theme in the literature, makes it difficult to find a scientific basis to corroborate with the findings of the present research. Considering the co-infections, almost 100% of the patients acquired another infection with up to three years after diagnosis of HIV.

Through this research, it was possible to show that the majority of PLWHA who presented co-infections and/or comorbidities presented viral load lower than 10,000 mm³ and CD4 of 200 to 499 mm³, relatively low values. Once again, bringing the importance of accompanying health professionals to adherence to drug treatment and preventive habits that reduce the risks of acquiring diseases and increase the quality of life of PLWHA.

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