

CLINICAL-NUTRITIONAL PROFILE OF HIV PATIENTS IN A REFERRAL HOSPITAL IN THE NORTHEAST OF BRAZIL

PERFIL CLÍNICO-NUTRICIONAL DE PORTADORES DO VÍRUS HIV ATENDIDOS EM UM HOSPITAL DE REFERÊNCIA DO NORDESTE BRASILEIRO

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ABSTRACT

Introduction: The acquired immunodeficiency syndrome is a chronic, progressive, and degenerative disease. Since the introduction of antiretroviral therapy (ART), a significant reduction in mortality and morbidity rates has been recorded. However, patients may present cardiometabolic changes throughout the treatment. **Objective:** To assess the clinical and nutritional profile of HIV patients treated in a referral hospital in northeast Brazil. **Methods:** Descriptive cross-sectional study performed in inpatient and outpatient units for infectious and parasitic diseases at the Hospital of the Universidade Federal de Pernambuco. Nutritional and clinical variables were assessed. The sample was a non-probabilistic convenience sample. The data were entered into Excel for Windows® and analyzed using SPSS® software (version 13.0), with a 5% level of significance set for the rejection of the null hypothesis. **Results:** In total, 110 patients were assessed (54.5% in infirmary). The mean age was 39±11 years, with 15.4% of the individuals aged 50 years or more. Of the total, 64.5% were male. Among the patients in the ward, 52.5% had metabolic complications; 1.6% had lipodystrophy, and 15% had wasting syndrome, while ambulatory patients showed values of 76%, 4%, and 4%, respectively. Time of diagnosis, indication, time, and adherence to ART showed no differences between the groups. **Conclusion:** The metabolic changes related to cardiovascular risk factors and the preservation of nutritional status prevailed in ambulatory patients, while the clinical-nutritional profile of hospitalized patients showed energy-protein malnutrition as the most common complication, with greater involvement of the immune system and increased frequency of opportunistic infections and gastrointestinal symptoms. The use of licit and/or illicit drugs, the lack of knowledge about the importance of medication, and the negligence in care were the main reasons for the irregular use of ART.

Keywords: wasting syndrome; lipodystrophy syndrome associated with HIV; acquired immunodeficiency syndrome.

RESUMO

Introdução: A AIDS caracteriza-se como doença degenerativa, crônica e progressiva. Após a introdução da terapia antirretroviral (TARV), observou-se uma importante redução na morbimortalidade. No entanto, ao longo do tratamento, os indivíduos podem apresentar alterações cardiometabólicas. **Objetivo:** Avaliar o perfil clínico-nutricional de portadores de HIV atendidos em um hospital de referência do Nordeste brasileiro. **Métodos:** Estudo do tipo descritivo transversal realizado no ambulatório e na unidade de internação de Doenças Infecto-Parasitárias (DIP) do Hospital das Clínicas da Universidade Federal de Pernambuco. Foram avaliadas variáveis nutricionais e clínicas. A amostra foi não probabilística por conveniência. Os dados foram digitados no programa Excel para Windows® e as análises realizadas no Programa SPSS® versão 13.0, com nível de significância de 5% para rejeição de hipótese de nulidade. **Resultados:** Foram avaliados 110 pacientes (54,5% em enfermaria). A média de idade foi 39±11 anos, e 15,4% possuíam 50 anos ou mais. Do total, 64,5% eram do sexo masculino. Entre os pacientes de enfermaria, 52,5% apresentaram complicações metabólicas; 1,6%, lipodistrofia e 15%, síndrome consumptiva, enquanto os pacientes ambulatoriais apresentaram valores de 76%, 4% e 4%, respectivamente. Tempo de diagnóstico, indicação, tempo e adesão à TARV não mostraram diferenças entre os grupos. **Conclusão:** As alterações metabólicas relacionadas a risco cardiovascular e à preservação do estado nutricional prevaleceram nos pacientes ambulatoriais, enquanto o perfil clínico-nutricional dos internados mostrou a desnutrição energético-proteica como a complicação mais frequente, com maior comprometimento do sistema imunológico e maior frequência de infecções oportunistas e sintomas gastrointestinais. O uso de drogas lícitas e/ou ilícitas, a falta de conhecimento sobre a importância da medicação e a negligência no autocuidado foram os principais motivos para o uso irregular da TARV.

Palavras-chave: síndrome de emaciação; síndrome de lipodistrofia associada ao HIV; síndrome da imunodeficiência adquirida.

INTRODUCTION

The identification of the acquired immunodeficiency syndrome (AIDS) has become a milestone in the history of humanity, highlighting it as one of the emerging infectious diseases by the great magnitude and extent of the damage caused to the population. AIDS behaves like a degenerative, chronic, and progressive disease, which is accompanied, during its evolution, by weight loss, and malnutrition of multifactorial origin¹.

In Brazil, the policy of universal and free distribution of antiretroviral drugs to infected people with the human immunodeficiency virus (HIV), stands out as an effective strategy to combat AIDS, which led to the introduction of antiretroviral therapy (ART). ART is the combination of three or more drugs that can significantly reduce morbidity and mortality rates and the prevalence of malnutrition among people living with AIDS, making it present characteristics of a chronic disease and require their carriers to maintain proper antiretroviral therapy².

One of the challenges has been to seek patients' adherence to established protocols, since non-compliance undermines both the effectiveness of the treatment and the spread of an epidemic by certain types of multidrug resistant viruses, with clinical and nutritional repercussions. It must be said that non-adherence has become a major issue in debates in the area, given the high number of patients who

The study was conducted at the Hospital of the Universidade Federal de Pernambuco (HC-UFPE) – Recife (PE), Brazil.

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do not properly use the scheme of medications prescribed or completely abandon their use³.

ART is changing the nutritional status of patients with HIV. Before the advent of ART, the deficits of vitamins and minerals and energy-protein malnutrition were associated as the greatest nutritional problems of the time, with malnutrition accounting for 80% of the mortality of AIDS patients⁴.

Today, with advances in ART, people living with HIV commonly present a variety of adverse metabolic events throughout the infection, characterized by dyslipidemia changes in body fat distribution, insulin resistance, glucose intolerance (GI), and high blood pressure. Even in the era of ART, weight loss, and depletion of body cell mass are still observed in this population. The incidence of alterations in nutritional status, both obesity induced by changes in body composition and malnutrition caused mainly by non-adherence to ART, tends to increase, and the monitoring of nutritional status of asymptomatic, symptomatic, or patients with changes in body weight is essential⁵.

A detailed assessment of nutritional status, carried out considering the energy needs, exacerbated catabolism, metabolic changes, and understanding of peculiarities that this population is exposed, not only allows the tracking of malnourished patients with metabolic disorders, as well as possible interventions for recovery of nutritional status and consequent better survival⁵.

METHODS

This is a descriptive, cross-sectional study. The data were collected in direct interview with patients and caregivers and through other information transcribed from medical records.

The research was conducted with patients of both genders with HIV, admitted in the ward of Infectious and Parasitic Diseases (IPD), and in the outpatient clinic of IPD at the Hospital of the Universidade Federal de Pernambuco (HC-UFPE) during the period ranging from June to November 2014. The sample was non-probabilistic for convenience, composed of all patients treated in the clinic and hospitalized in the general ward of HC-UFPE who were eligible and agreed to participate in the research during that time frame. Exclusion criteria were patients who were in use of corticosteroids and anabolic steroids; had undergone liposuction or liposculpture in the previous six months; who had fluid retention (ascites and edema); pregnant women; patients in palliative care; with impossibility of locomotion; and patients who had cognitive changes that hindered the obtaining of relevant information.

The research was conducted after approval from the Research Ethics Committee of the Universidade Federal de Pernambuco (Opinion No: 624.987/CAAE: 27561214.9.0000.5208), in obedience to resolution No. 466/12 of the National Health Council on "Research Involving Human Subjects". Patients were informed by the researcher on the procedures, risks, and benefits of the research, and their voluntary participation by signing the free and informed consent.

Participants were weighed using a digital electronic scale, platform type, by Filizola[®], with a maximum capacity of 150 kg and accuracy of 100 g, and height was measured by stadiometer attached to the scale platform with a capacity of 1.90 m ± 1 mm. With weight and height measurements, the body mass index (BMI) was calculated,

which has been classified in accordance with the values indicated by the World Health Organization (1998)⁶ for adults. For the elderly (>60 years), the reference was Lipschitz (1994)⁷. The percentage of weight loss was assessed in the period prior to the hospitalization or treatment in the outpatient clinic. It was obtained using the following formula: $\text{weight loss (\%)} = (\text{usual weight} - \text{current weight}) \times 100 \div \text{usual weight}$. The classification followed the parameters of Blackburnet and Thornton⁸. Usual weight was based on the usual weight of the patient when he was healthy, and normally performing their routine activities.

Measurement of waist circumference (WC) was made from the midpoint between the costal margin and the iliac crest, using a non-extendible metric fiber tape with divisions in centimeters, accurate to millimeters. The cutoff points for increased risk of the International Diabetes Federation (2005) were used⁹.

The measurement of arm circumference (AC) was performed according to the technique proposed by Kamimura (2006)¹⁰. The triceps skinfold thickness (TSF) was obtained with a Lange adipometer[®], according to recommendations of Lee and Nieman (1995)¹¹. To obtain the arm muscle circumference (AMC), the formula by Gurney and Jelliffe (1973)¹² was used, which utilizes the AC and TSF variables. The classification of the TSF, AC, and AMC was compared to the standard of reference: up to 74.9 years¹³.

The measurements were performed in duplicate, and it was assumed a variation of 0.5 cm for the measures of height, AC, WC, and 100 g for measurements of weight. If the values obtained differed from the previously prescribed margin of error, a third measurement was carried out, adopting the average of the two values closest to each other.

We evaluated the serum by their respective methods: hematocrit, hemoglobin, mean corpuscular volume (MCV), leukocytes (Pentra 120), albumin (Beckman Coulter Automation), fasting blood glucose (God – DBP DiaSys/Beckman Coulter Automation), total cholesterol and fractions, triglycerides (God – DBP DiaSys/Beckman Coulter Automation), review of total lymphocyte count, and CD4 T lymphocytes (flow cytometry/Facsalibur-Multitest).a).

For the identification of opportunistic infections (OIs) and diseases associated with HIV, the clinical diagnosis made by the medical team and recorded in the patient record was consulted.

Patients were asked about the regular use or not of ART. When patients reported irregular use, they were questioned about the possible factors responsible for irregularities.

Presence of wasting syndrome was considered when the individual was involuntarily losing weight greater than 10%, associated or not with fever documented for more than 30 days, weakness, and diarrhea (>2 bowel movements per day for more than 30 days). Presence of lipodystrophy was characterized when WC >102 cm for men and >88 cm for women and/or had fat accumulation in the neck, upper back, or chest. Diagnosis was given by patient self-report and by means of the observation of abnormal deposits of body fat.

Assessments of changes mentioned above were made by consulting records, direct questions to patients about changes in physical condition over the years, anthropometric assessment, physical examination, fasting blood glucose, and lipid profile.

For the diagnosis of diabetes and GI, the cutoff points of the Brazilian Society of Diabetes were used, 2013–2014¹⁴, and for the identification of dyslipidemia, the cutoff points of the Brazilian Society of Cardiology¹⁵.

Data were entered into Excel for Windows®, and the analysis conducted in SPSS®, version 13.0. Continuous variables were tested for normality of distribution using the Kolmogorov–Smirnov test. The variables with normal distribution were described as mean and standard deviation, while those with non-normal distribution were presented as medians and their interquartile ranges.

In statistical inference tests, the proportions were compared using the χ^2 test of Pearson. The means of the variables with normal distribution were compared by Student's *t* test (two variables), and the Mann–Whitney test (two variables), and the Kruskal–Wallis test (more than two variables) when the criterion of normality and/or homoscedasticity had not been met. A significance level of 5% for the rejection of the null hypothesis was used.

RESULTS

We evaluated 110 patients, and of these, 54.5% were from the ward and 45.5% from the clinic. The mean age was 39±11 years, being 23.7% between 18 and 29 years, 30.9% between 30 and 39 years, 30.0% between 40 and 50 years, and 15.4% with age greater than 50 years. In total, 65.5% were male. **Table 1** shows the clinical characteristics of the study population.

The following reasons were cited for the irregular use of ART: use of legal drugs and/or illicit drugs (17.3%), lack of knowledge about the importance of medicine, negligence in care (11.7%), forgetfulness (9.9%), depressive disorders and/or denial of the disease (6.3%), and others (54.8%).

The most common reasons that led to the hospitalization were bacterial infections (32.47%), diseases caused by protozoans (16.80%), diseases caused by viruses (12.20%), neoplasms (8.80%)

Table 1 – Clinical variables of patients with HIV from ward and clinic of the HC-UFPE Recife, in the year 2014.

	Site		p value
	Ward	Clinic	
Time for diagnosis (years)*	Median (IQ) 2 (0.20–8.70)	Median (IQ) 2 (1.12–9.25)	0.070
Indication of ART**	n (%) 56 (93.30)	n (%) 44 (88.00)	0.507
Time of ART (years)*	Median (IQ) 0.8 (0.30–7.00)	Median (IQ) 2 (1.00–8.00)	0.100
Regular use of ART**	n (%) 30 (50.00)	n (%) 29 (56.00)	0.246
Current scheme	n (%)	n (%)	
2NRTI+NNRTI	34(60.71)	21 (47.80)	
2NRTI+IP/r	23 (23.20)	11 (25.00)	0.130
2NRTI+IP	4 (7.14)	2 (4.54)	
Others	5 (9.00)	10 (22.72)	

ART: Antiretroviral therapy; IQ: Interquartile Range; NRTI: Nucleoside Reverse-Transcriptase Inhibitors; NNRTI: Non-Nucleoside Reverse-Transcriptase Inhibitors; IP: Protease Inhibitor; r: Ritonavir.

*Student's *t* test (mean and standard deviation); **Fisher's exact test.

and causes that were not directly linked to HIV infection (29.74%). In the clinic, most frequent co-infection related to HIV was the Herpes Zoster, with a percentage of 3.5%. Patients with no apparent pathologies were 62.5%.

The presence of gastrointestinal symptoms in the week prior to participation in the study was also analyzed. In the ward, 79% of patients reported some related clinical manifestation: diarrhea (15.8%), nausea (15.8%), appetite loss (11.6%), and vomiting (11.6%) were the most reported. In the clinic, these events were reported by 50% (n = 25), being abdominal pain (10%), heartburn (44%), nausea, and bloating (6.95%) the most prevalent.

Some metabolic abnormalities were identified: diabetes mellitus, dyslipidemia, and hypertension accounted for 5%, 37.5%, and 5% in the ward and the 6%, 52%, and 8% in the clinic, respectively. Among patients in the clinic, 10% showed GI. Wasting syndrome was found in 15% of the patients in the ward and in 4% in the clinic, while lipodystrophy was found in 1.6% and 4%, respectively, in the two study sites.

Tables 2 and 3 show the anthropometric variables and the nutritional status of the population studied, respectively. **Table 4** describes the surveyed biochemical variables.

Stratifying the levels of T-CD4 (cells/mm³): in the ward, 82.8% patients obtained values of T-CD4 < 350 and 17.4% > 350; at the clinic 66% of patients obtained T-CD4 > 350 and 34% < 350. The value of 350 cells/mm³ was used as a cutoff point as it is used in notifications of illness and orientation to the beginning of ART.

DISCUSSION

In the population studied, the majority were male (64.5%), with an average age of 39±11 years, being the most affected age group between 30 and 39 years. This profile is similar to that found in studies by Castro et al. (2013)¹⁶ e Schuelter-Trevisol et al. (2013)¹⁷, in which the majority of the population was composed of young adults and males. The data were also in accordance with recent data from the Epidemiological Bulletin of 2014¹⁸, which showed 65% of the cases in men and in the predominant age range from 25 to 39 years, which may be justified by the correspondence to the period of greater sexual activity.

Table 2 – Anthropometric variables of patients with HIV from ward or clinic of the HC-UFPE Recife, in the year 2014.

	Site		p value
	Ward	Clinic	
Usual Weight (kg)*	63.86±13.96	66.06±13.66	0.419
Current Weight (kg)*	55.57±14.14	67.81±11.17	<0.001
Body mass index (kg/m ²)*	20.00±3.90	25.21±4.55	<0.001
Arm Circumference (cm)*	24.16±4.16	28.83±4.07	<0.001
Triceps skinfold thickness (mm)**	9.0 (6.00–13.90)	15.5 (7.00–26.00)	0.001
Arm muscle circumference (cm)	20.81±3.54	23.44±3.40	<0.001
Waist circumference (cm)	–	90.38±9.96	–

*Student *t* test (mean and standard deviation); **Mann-Whitney test (median and interquartile range).

Table 3 – Classification of nutritional status of patients with HIV from ward or clinic of the HC-UFPE Recife, in the year 2014.

Variables	Site		p value
	Ward n (%)	Clinic n (%)	
Body Mass Index*			
Malnutrition	24 (41.40)	2 (4.10)	<0.001
Eutrophia	27 (46.60)	23 (46.90)	
Overweight	7 (12.10)	24 (49.00)	
Arm Circumference*			
Malnutrition	51 (85.00)	24 (68.20)	<0.001
Eutrophia	9 (15.00)	17 (34.00)	
Overweight	0 (0.00)	9 (18.00)	
Triceps Skinfold Thickness*			
Malnutrition	44 (73.30)	25 (50.00)	0.030
Eutrophia	5 (8.30)	5 (10.00)	0.030
Overweight	11 (18.30)	20 (40.00)	0.030
Arm Muscle Circumference**			
Malnutrition	49 (81.70)	22 (65.10)	<0.001
Eutrophia	11 (18.30)	27 (55.10)	
Waist circumference*			
High Risk	–	27 (54.00)	–
%Weight Loss*	14.56±8.70	7.02±4.97	0.021

* χ^2 Pearson test; **Yates Correction.

Table 4 – Biochemical variables of HIV patients from ward or clinic of HC-UFPE - Recife, in 2014.

	Site		p value
	Ward	Clinic	
Hematocrit (%)*	31.20±6.74	40.53±4.66	<0.001
Hemoglobin (g/dL)*	10.41±2.29	13.61±1.58	<0.001
MCV (fl)*	88.88±12.30	95.80±10.47	0.002
Leukocytes (/mm ³)*	5,064.08±2,808.02	6,359.18±2,002.41	0.008
Typical lymphocytes (%)*	22.82±11.27	31.17±9.50	<0.001
Albumin (g/dL)	2.81±0.84	–	–
Total cholesterol (mg/dL)*	151.24±66.10	176.35 ±41.06	0.043
HDL cholesterol (mg/dL)*	36.96±17.17	46.98±12.87	0.005
LDL cholesterol (mg/dL)*	87.72±49.44	94.26±24.80	0.531
Triglycerides (mg/dL)*	138.23±72.23	145.30±78.36	0.689
CD4+ (/mm ³)*	185.66±224.50	519.53±317.70	<0.001

MCV: Mean Corpuscular Volume; HDL: High-density lipoprotein; LDL: Low-density lipoprotein; CD4+: CD4 T lymphocytes (immune cells); *Student *t* test (mean and standard deviation).

Ideally, the diagnosis of HIV infection is done early, soon after infection. However, the low specificity of the seroconversion of the virus, the long asymptomatic period or the presence of symptoms similar to typical viruses infections, such as avian flu, make this diagnostic process difficult. The definition of delayed diagnosis

widely accepted is a CD4 cell count in patients below 350 cells/ml or symptoms compatible with AIDS¹⁹. In this study, the time of diagnosis showed a significant difference between patients from the ward and the outpatient clinic. This fact can be explained by the non-investigation of diagnosis as early or late.

The indication of ART showed no significant difference between patients of both origins (93.3% in ward and 88% in the clinic). Studies that compare both these two environments are scarce in the literature. In a study that examined 476 medical charts and schedules of compulsory notification (outpatients), 64.1% had indication and made use of the anti-retroviral medication¹⁷; in a study that assessed only patients admitted (n=50), 68% had indication and made use of the aforementioned medication¹⁶. Among those admitted to the ward, factors for no indication of ART were related to admissions to treat conditions unrelated to HIV and good individual immune performance. Those from the clinic may have a reduced indication of ART due to recent diagnosis and good immune performance. Regarding the regularity in the use of ART, it was expected that the deficiency was more pronounced in the ward than in the clinic, because the main reasons for hospitalization were related to the onset of pathologies related to AIDS. Although there is no difference in the use, a significant portion of the population admitted was observed to have been diagnosed very recently or during hospitalization, already with an indication of ART, and these were advised and supervised daily by health professionals, which guaranteed the proper use of medication. Another important aspect is that over half of the patients, in both places, were not properly using the medication prescribed, as evidenced by Seild et al. (2007)²⁰. In another study conducted at the Specialized State Center in Diagnosis, Care and Research (CEDAP), reference unit for care in HIV/AIDS in the city of Salvador, among the 216 patients

followed up for one year, 25% did not use correctly and regularly the antiretroviral drugs²¹.

The medical literature refers the difficulties of adherence to treatment are derived, in part, to the complexity of ART, to the extent that some medicines need to be ingested with food, other fasting, or in temporal sequences in combination with other medicines, which requires organization and commitment of the patient in relation to its treatment, in addition to effects caused by the drug combination. In addition to these factors, studies have demonstrated a negative association between moderate consumption/abuse of alcohol and other drugs and adherence.²²

The presence of gastrointestinal clinical manifestations was common in a significant proportion of the patients, both in the ward (79%) as in the clinic (50%). In the literature, we found the main causes for such disorders, those being the influence of HIV in intestinal cells, the presence of OIs, the high incidence of parasitic diseases, including the intestines, and the side effects of ART²³.

The presence of OI or defining pathologies of AIDS (diseases that are associated to the biochemical tests and assist in the diagnosis of the syndrome) were more frequent in patients hospitalized. These conditions can bring serious clinical, nutritional, and physiological repercussions, requiring more discerning treatment and monitoring that, many times, can only be carried out with the patient hospitalized. In the clinic, individuals present a better immune status, being less prone to OIs and, on the other hand, more susceptible to diseases that are not related to HIV and cardiovascular diseases, results similar to those of Da Silva et al.²⁴.

The percentages of metabolic complications were 52.5% in the ward and 76% for patients in the outpatient clinic. Similar values were found in other studies, in which the authors suggest that such complications may be related both to ART, since different regimes of therapy and time of use have promoted different changes in metabolism, just as presence of the infection itself. Metabolic complications linked to HIV can improve after changes in lifestyle, since proper nutrition and regular physical activity can promote the control of these changes²⁵.

Lipodystrophy found in HIV infection is considered an adverse effect to the use of ART, characterized by the redistribution of body fat with fat reduction in peripheral region and an increase in the abdominal region. This adverse effect was found in 1.6% of patients in the ward, and 4% of the clinic, although such percentages are considered low compared to other studies such as Diehl et al.²⁶, which found 55% of lipodystrophy. However, when analyzing the BMI and WC of outpatients, high values of these parameters were found. In contrast, the values of AC and TSF revealed a high percentage of malnutrition, which may suggest a redistribution of body fat.

When assessing the anthropometric variables (BMI, AC, AMC, TSF) and its nutritional classifications, it was found that the outpatients had higher values of these parameters, corroborating the literature, in which patients who had a better disease control and better immune status were more likely to be eutrophic or overweight. In contrast, in those whose infection was advanced, with the presence of OIs and depletion of the immune system, were more prone to malnutrition and wasting syndrome²⁷.

As for the biochemical variables, hospitalized patients had lower hemoglobin, hematocrit, MCV, leucocytes, and lymphocytes in relation to patients in the clinic. It is known that many factors can contribute to changes in these values, among them the very marrow suppression caused by HIV, OIs, malnutrition, and others, leading to anemia or even pancytopenia, which are hematological changes more frequent in these patients²⁸.

Diehl et al. (2008)²⁶ studying patients who lived with HIV treated in the outpatient clinic, found values of CD4 (431.4 ± 254.5) similar to those of the outpatients in this study (519.53 ± 317.7), and higher than those of the ward (185.66 ± 224.5). The values of total lymphocytes and CD4 show improved immune performance in clinic patients. This aspect may have directly influenced on the differences in nutritional profile, and found a higher number of cases of malnutrition in patients in the ward, and eutrophication or excess weight among those who attended the outpatient clinic. The latter often were carriers of the virus, but had not developed the syndrome (AIDS) and, consequently, had no depletion of nutritional status.

It is important to emphasize the importance of nutritional monitoring, through which it is possible to educate and provide proper nutrition to maintain or improve the nutritional status of patients with HIV.

CONCLUSION

Despite the diagnosis, time of use, and regularity of ART showing no significant difference between inpatients and outpatients, the metabolic changes related to cardiovascular risk and preservation of nutritional status prevailed in outpatients, whereas the clinical and nutritional profile of admitted patients showed the protein-energy malnutrition as the most common complication, with greater involvement of the immune system and increased frequency of OIs and gastrointestinal symptoms. The use of licit and/or illicit drugs, the lack of knowledge about the importance of medication, and the negligence in self-care were the main reasons for the irregular use of ART.

In the face of the findings, it is important to emphasize that every patient infected with HIV should be directed to the dietician soon after diagnosis, to assess their nutritional profile and to determine necessary diet-therapeutic interventions individually, to treat possible nutritional deficiencies and to maintain or restore the nutritional status, promoting a better quality of life.

Conflict of interests

The authors reported no conflict of interests.

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