ORIGINAL ARTICLE

Nutritional Status, Physical Activity and Quality of Life in Children and Adolescents with Human Immunodeficiency Virus Infection

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Abstract

Introduction: The growth and cellular immune function of human immunodeficiency virus infected children is impaired by their nutritional status. Most of them experience nutrition deficits and malnutrition, but a longer follow-up metabolic syndrome has been described. The aim of the study was to assess the nutritional status, physical activity, and quality of life in human immunodeficiency virus infected children and adolescents.

Methods: Cross-sectional study with a sample of 31 human immunodeficiency virus infected patients assessed based on anthropometry: weight, height, body mass index, triceps skinfolds, and mid-upper arm circumference. Body composition obtained by electrical bioimpedance and expressed as fat mass and lean body mass, dietary intake through recall 24-hour, physical activity through a Baecke questionnaire of habitual physical activity and health-related quality of life through Kidscreen-27.

Results: *Z*-scores of body mass index revealed 25% overweight and 7.1% obese. Dietary intake of critical vitamins, nutrients, minerals, sugar, and energy do not correspond to dietary reference intakes. The Baecke questionnaire of habitual physical activity demonstrated that the physical activity of males is higher than females. The differences by gender were found in physical well-being ($p < 0.05$) and psychological well-being ($p < 0.05$), with males being associated with better well-being, they also presented higher physical and psychological well-being, autonomy and parent relation, and social support and peers. Higher body mass index *z*-score values were associated with lower values of resistance, reactance, fiber intake, and physical well-being.

Discussion: Patients presented an unbalanced dietary intake. However, most were eutrophic. The subjects follow the trends of healthy children concerning physical activity, the same is not seen about health-related quality of life.

Keywords: Adolescent; Child; Exercise; HIV Infections/complications; Nutritional Status; Portugal; Quality of Life; Surveys & Questionnaires

Introduction

Human immunodeficiency virus (HIV) type 1 and type 2 are retroviruses that primarily infect T-cells expressing CD4 antigen.[1-3] It ultimately causes the immune cells destruction and death, leading to a weakened immune system, which impairs the host ability to fight off infection.[1,2] In 2017, 886 new cases of infection were diagnosed and reported in Portugal, of which 3.5% (31) were younger than 15 years.[4]

Combined antiretroviral therapy (cART) suppresses viral replication, preserves immunity, and reduces HIV morbidity and mortality.[5,6]

Nutritional status is directly related with cellular immune function and most children experience nutritional deficits.[1,7] Malnutrition has a deleterious effect on the immune function, the etiology is multifactorial and may result from decreased intake, increased losses, increased requirements, and psychosocial barriers.[8-10]

In developed countries, children are living longer and are continuously exposed to antiretroviral drugs, which may be associated with metabolic syndrome, with body fat redistribution, altered serum lipid levels, insulin resistance, and decreased bone mineral density, thereby contributing to a high risk for cardiovascular disease.[11-13]

Children and adolescents infected with human

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immunodeficiency virus also have a predisposition to a sedentary lifestyle and low physical activity as well as an increased prevalence of obesity.[11-14] Regular physical activity is linked to many positive health outcomes with evidence of its multidimensional benefits.[11-13,15]

Nutrition care is tailored to clinical manifestations, growth, dietary history, gastrointestinal function, and social issues.[16] Optimal nutritional status assists in the support of immune function, and both promote a higher health-related quality of life.[16-18] Health-related quality of life instruments allow screening and the early detection of possible impairments in children's well-being and functioning, and the social and behavioral determinants of health.[17]

The aim of this study was to evaluate the nutritional state, physical activity, and quality of life in children and adolescents infected with HIV.

Methods

The cross-sectional study data was collected in a four-month period, in which 31 children and adolescents were included in the present study.

Patients previously identified from clinical records as having an HIV diagnosis with regular follow-up at a pediatric infectious disease outpatient clinic at a university hospital in Lisbon were eligible for participation. The university hospital provided the ethical approval for the study. The patients and their legal guardians were asked if they were willing to participate in the study with a brief explanation describing the purpose of the study and procedures as well as the right to refuse to participate through informed consent. Children and adolescents over 7 years of age and under 19 years whose legal guardian authorized their participation in the study by signing an informed consent were included.

Patients whose physical condition or comorbidities impeded data collection or with acute illness during the four weeks prior to data collection were excluded.

Sociodemographic and clinical data

Sociodemographic and clinical data were collected through a questionnaire. Sociodemographic data collected included age, race, and gender, and the clinical data included HIV diagnosis, HIV type, mode of transmission, HIV stage, CD4+ classification, and current combined antiretroviral therapy. The clinical categories for HIV infection were divided into[1]:

- Category E: perinatal exposure;
- Category N: not symptomatic;
- Category A: mildly symptomatic;
- Category B: moderately symptomatic;
- Category C: severely symptomatic.

Nutritional status assessment

Nutritional status was assessed through the evaluation of dietary intake, anthropometry measurements, and body composition.

Dietary intake

To evaluate dietary intake, the 24-hour diet recall was used, validated for the Portuguese population. The Portuguese food quantification manual that contains photographic models of food and measures was used to help the participants in the quantification of portion sizes. Macronutrients (protein, carbohydrates, energy) and micronutrients (fiber, sodium, potassium, calcium, phosphorus, iron, magnesium, zinc, vitamin A, vitamin D, vitamin E, vitamin B, vitamin B1, vitamin B2, vitamin B6, vitamin B12, niacin, vitamin C, and folic acid) intake was analyzed through dietary reference intakes.[19]

Anthropometric measurements

The anthropometric measurements considered were weight, height, body mass index (BMI), triceps skinfold, and mid-upper arm circumference.

Their weight was measured with a calibrated electronic scale (0.1 kg), height to the millimeter using a stadiometer, BMI calculated as the ratio of the weight (kg) to the square of the height (m), triceps skinfolds using a Harpenden calibrator, and the mid-upper arm circumference using a non-elastic measurement tape.

The mid-upper arm circumference and triceps skinfolds percentile were calculated through Frisancho data.[20] The weight, height, and body mass index percentile and *z*-score were calculated using the Centers for Disease Control growth charts.[21]

Body composition

To assess body composition, bioelectrical impedance (BIA 450) analyses was used. The data collected included the fat mass index and lean body mass, resistance, reactance, phase angle, and basal metabolic rate. Diagnostic criteria lipodystrophy used was based on anthropometric values weight and triceps skinfolds. Children and adolescents with normal weight or overweight with triceps skinfolds below the reference value were considered to have lipodystrophy.

Kidscreen-27 questionnaire

The Kidscreen-27 questionnaire is a health-related quality of life instrument specifically developed for

children and adolescents aged 8-18 years who have a chronic disease. Although not designed specifically for HIV-positive children and adolescents, this generic instrument integrates the consequences of comorbidities and potential side effects from treatment into one single assessment. The Kidscreen-27 questionnaire includes various latent factors concerning physical, psychological well-being and social life highly relevant for adolescents and children living with HIV or acquired immunodeficiency syndrome (AIDS). The Kidscreen-27 questionnaire reflects five health-related quality of life dimensions:

- Physical well-being (five items);
- Psychological well-being (seven items);
- Parent relations and autonomy (seven items);
- Social support and peers (four items);
- School environment (four items).

Each item is scored on a five-point scale (1 = not at all, 2 = a little, 3 = moderately, 4 = much and 5 = very much).[22-24]

Baecke questionnaire

The Baecke questionnaire of habitual physical activity is an instrument that evaluates habitual physical activity over the previous 12 months and consists of 16 questions. It is easily applied and understood, making use of qualitative and quantitative scales to assess the magnitude of school activity (eight questions), sports activity (four questions), and leisure time (four questions). The total score for habitual physical activity is obtained by adding the three dimension scores.[25]

Statistical analysis

Descriptive statistics and frequencies such as mean and standard deviation (SD) were used to summarize data from sociodemographic and clinical characteristics, nutritional characteristics, average daily intake of energy, physical activity, and health-related quality of life of children and adolescents with HIV infection.

A non-parametric Mann-Whitney test was used to investigate the differences in mean health-related quality of life and Baecke questionnaire of habitual physical activity between the genders. Spearman correlation (rs) was used to understand if there was a correlation between specific variables. The data collected was processed and analyzed using the IBM® SPSS® v.25. The level of significance was $p < 0.05$.

Results

Children and adolescents mean age was 14.1 ± 3.5 years, HIV time from diagnosis mean was 10.1 ± 5.1 year. All of the patients (n = 31) were HIV-1 infected and 93.5% (n = 29) acquired HIV infection because of mother to child transmission. According to T CD4+ counts, 67.7% (n = 21) of the patients were currently in category 1, and most had moderate to severe symptoms of HIV infection. According to the combined antiretroviral therapy results, three of them did not take any medication, and nucleoside/nucleotide reverse transcriptase inhibitors (NRTI) were the most used drugs (n = 25) followed by non-nucleoside reverse transcriptase inhibitors (NNRTI) with 17 subjects. The characteristics of the study subjects are shown in Table 1.

Regarding the *z*-scores, 60.8% (n = 17) had a normal body mass index *z*-score, and 25% (n = 7) were overweight. The mean mid-upper arm circumference *z*-score was 0.26 ± 0.8, and triceps skinfolds was -0.67 ± 0.98. According to the fat mass index results, 70% (n = 21) had normal values, and 70% (n = 21) of subjects had normal values and 30% (n = 9) has high values of lean body mass index, according to the reference values. The prevalence of lipodystrophy was 32.2%. Data from bioelectrical impedance analysis included the mean values of resistance, reactance, and phase angle by gender. Female mean resistance, reactance, and phase angle values were higher compared to males. The nutritional characteristics of the patients are summarized in Table 1.

Children and adolescents demonstrate inadequate intake of several micronutrients, such as vitamin A, vitamin D, vitamin E, folate, iron, calcium, potassium, magnesium, fiber, and zinc. Protein, sodium, and sugar intake was substantially elevated, considering the estimated average requirements. Energy intake was considerably high, since 63.3% (n = 19) of the subjects had values above their needs according to the metabolic basal rate. The energy and nutrient mean intake divided by age group is shown in Table 2.

Through the Baecke questionnaire of habitual physical activity, the physical activity results demonstrate that the male mean (8.89 ± 2.46) is higher than the female mean (8.08 ± 1.70). The same occurred in the school activity index and sport activity index, except in the leisure time index.

Regarding health-related quality of life, using the Kidscreen-27 questionnaire, the results reveal that male mean scores on physical well-being (26.89 ± 4.58), psychological well-being (21.43 ± 1.70), autonomy and parent relation (20.12 ± 3.99), and social support and peers (37.67 ± 3.60) are higher than female mean scores. School environment results reveal female mean scores is higher (31.36 ± 5.66). In this study, differences were found between the genders in the parameters of

physical well-being (p = 0.003) and psychological well-being (p = 0.046). Physical activity and health-related quality of life of children and adolescents with an HIV infection are summarized in Table 3.

The higher body mass index *z*-score values were associated with lower values of resistance, reactance, fiber intake, sports activity index score, physical well-being, psychological well-being, autonomy and parent relation and school environment scores (p < 0.05). Regarding physical well-being, according to the study, it is associated with a better score of physical activity, sports activity index, and psychological well-being (p < 0.05). The correlation between the body mass index *z*-score and physical well-being with multiple variables are described in Table 4.

Table 1. Sociodemographic, clinical, and nutritional characteristics of children and adolescents with human immunodeficiency virus infection

Variables	n (%)	Variables	Mean ± SD
HIV Type		***Z*-score**	
HIV – 1	31 (100)	Weight *z*-score	0.08 ± 1.13
		Height *z*-score	-0.39 ± 1.17
Transmission		Mid-upper arm circumference *z*-score	0.02 ± 1.42
Mother-to-child	29 (93.6)	Triceps skinfold *z*-score	-0.67 ± 0.98
Sexual	1 (3.2)	BMI *z*-score	0.26 ± 1.00
Undetectable	1 (3.2)	Fat mass index	4.1 ± 3.2
		Lean body mass index	17 ±2.7
		n (%)	
Stage			
N0	2 (6.5)	**BMI *z*-score**	
N1	7 (22.5)	Thinness	1 (3.2)
N2	1 (3.2)	Normal	22 (71.0)
A1	4 (12.9)	Overweight	7 (22.6)
B	1 (3.2)	Obesity	1 (3.2)
B1	3 (9.7)	**Fat mass index**	
B2	2 (6.5)	Low	8 (26.7)
B3	4 (12.8)	Normal	21 (70.0)
C1	2 (6.5)	High	1 (3.3)
C3	3 (9.7)	**Lean body mass index**	
Undetectable	2 (6.5)	Normal	21 (70.0)
		High	9 (30.0)
		Lipodystrophy	10 (32.2)
T CD4+ classification			
Category 1 (>25%)	21 (67.7)		
Category 2 (16%-24%)	7 (22.6)	**Bioelectrical impedance analysis**	
Category 3 (<15%)	3 (9.7)	Resistance Ω	556.9 ± 99.1
		Female	570.1 ± 69.1
cART therapy		Male	533.2 ± 139.6
NRTI	25 (80.6)	Reactance Ω	74.9 ± 19.1
NNRTI	17 (54.8)	Female	80.4 ± 21.2
PI	13 (41.9)	Male	65.0 ± 6.6
INI	6 (19.4)	Phase angle	7.7 ± 1.6
None	3 (9.7)	Female	8.0 ± 1.7
		Male	7.2 ± 1.4

BMI - body mass index; cART - combined antiretroviral therapy; HIV - human immunodeficiency virus; INI - integrase inhibitors; NNRTI- non-nucleoside reverse transcriptase inhibitors; NRTI - nucleoside/nucleotide reverse transcriptase inhibitors; PI - protease inhibitors; SD - standard deviation.
Stages: category E: perinatal exposure; category N: not symptomatic; category A: mildly symptomatic; category B: moderately symptomatic; category C: severely symptomatic.

Discussion

Effective combined antiretroviral therapy led to a dramatic reduction in AIDS related mortality and concerns over nutritional deficiencies in the HIV-infected population have shifted from acquired immunodeficiency syndrome wasting syndrome, growth stunting, and chronic diarrhea to newly described long-term complications associated with chronic HIV infection secondary to increased inflammation, oxidative stress, and immune activation.[1,26] There is an increased risk of cardiovascular disease that has been shown to be associated with nutritional deficiencies.[27,28] In addition, HIV-infected patients are at increased risk for lipid abnormalities and metabolic syndrome, which have been shown to improve with dietary intervention.[4,28-30]

Some NRTI may be associated with lipoatrophy (zidovudine) or increased lipid levels (tenofovir, alafenamide).[31]

According to the body mass index mean *z*-scores, this study reflects the findings in the literature, which translates as an increase in overweight (22.6%) and obese (3.2%) patients and a smaller percentage of thinness (3.2%).[11,14]

There are clinical trials that propose phase angle (the relation between the two vector components of impedance as well as resistance and reactance) as a useful prognostic marker in HIV infection being a low phase angle and independent adverse prognostic marker of clinical progression and survival.[32] However, these data are lacking in children and adolescents.[33] The body mass index was shown to have an independent effect on impedance measures, reactance, resistance and, consequently, on the phase angle.[32] This study demonstrates a negative correlation between the body mass index and reactance and resistance.

Combined with a rising prevalence of obesity in this population and higher nutritional risk due to growth and development demands, nutritional deficiencies in this population are a subject of concern.[29,30]

Proper nutrient intake is vital for optimal health in the HIV-infected population, as many micronutrients have been associated with diseases known to be increased in this population.[1]

Table 2. Average daily intake of energy and nutrients of human immunodeficiency virus infected children and adolescents

	4-8 years	9-13 years	14-18 years
Variables	**Mean ± SD**	**Mean ± SD**	**Mean ± SD**
Energy (kcal)	1641 ± 129	1989 ± 631	1606 ± 489
Protein (g)	72.4 ± 14.9	89.4 ± 30.5	74.0 ± 21.9
Carbohydrates (g)	235.9 ± 6.8	263.6 ± 92.2	201.9 ± 78.1
Sugar (g)	127.7 ± 0.3	111.0 ± 50.8	78.1 ± 39.4
Fiber (g)	18.2* ± 5.0	20.0* ± 7.7	13.5* ± 7.8
Sodium (mg)	1360.3 ± 248.5	2087.2 ± 769.2	1639.2 ± 767.8
Potassium (mg)	3259.6* ± 244.6	2875.1* ± 1396.7	2225.1* ± 621.9
Calcium (mg)	929.7* ± 18.7	786.4* ± 402.6	546.9* ± 187.0
Phosphorus (mg)	1109.3 ± 108.5	1305.8 ± 400.9	950.6* ± 331.8
Iron (mg)	8.6* ± 2.3	9.6 ± 4.0	7.7* ± 3.2
Magnesium (mg)	235.4 ± 64.2	277.7 ± 95.9	189.6* ± 63.3
Zinc (mg)	6.6 ± 1.5	8.7 ± 3.0	7.8* ± 2.6
Vitamin A (µg)	392.2* ± 145.8	429.2* ± 238.3	344.6* ± 200.6
Vitamin D (µg)	2.1* ± 0.5	5.9* ± 5.6	2.7* ± 2.1
Vitamin E (mg)	5.4* ± 1.5	6.0* ± 3.8	5.0* ± 2.6
Vitamin B1 (mg)	1.0 ± 0.5	1.1 ± 0.5	1.1 ± 0.5
Vitamin B2 (mg)	1.5 ± 0.2	1.5 ± 0.8	1.2 ± 0.4
Vitamin B6 (mg)	2.1 ± 0.7	1.7 ± 0.8	1.6 ± 0.5
Vitamin B12 (µg)	2.8 ± 0.6	3.5 ± 2.4	3.3 ± 1.2
Niacin (mg)	17.8 ± 8.5	23.3 ± 13.6	18.6 ± 6.7
Vitamin C (mg)	75.5 ± 52.1	89.8 ± 58.9	61.5 ± 48.3
Folate (mg)	134.9* ± 75.9	169.3* ± 74.6	133.9* ± 50.2

SD - standard deviation.
*inadequate intake

Table 3. Physical activity and the health-related quality of life of children and adolescents with a human immunodeficiency virus infection

Variables	Mean ± SD	
Baecke questionnaire of habitual physical activity		***p***
School Activity index	3.17 ± 1.22	
Female	3.12 ± 1.27	0.581
Male	3.26 ± 1.19	
Sports Activity Index	2.41 ± 0.93	
Female	2.16 ± 0.83	0.091
Male	2.81 ± 0.97	
Leisure Time Index	2.81 ± 0.76	
Female	2.80 ± 0.82	0.951
Male	2.82 ± 0.86	
Physical Activity	8.40 ± 2.03	
Female	8.08 ± 1.70	0.465
Male	8.89 ± 2.46	
Kidscreen 27 – Health related quality of life		***p***
Physical well-being	22.58 ± 6.45	
Female	19.86 ± 6.03	0.003
Male	26.89 ± 4.58	
Psychological well-being	19.99 ± 3.00	
Female	19.08 ± 3.32	0.046
Male	21.43 ± 1.70	
Autonomy and parent relation	19.07 ± 3.99	
Female	18.40 ± 4.28	0.230
Male	20.12 ± 3.39	
Social support & peers	36.29 ± 5.37	
Female	35.42 ± 6.17	0.457
Male	37.67 ± 3.60	
School environment	31.28 ± 6.31	
Female	31.36 ± 5.66	0.826
Male	30.90 ± 7.48	

Differences between genders with a Mann-Whitney test.

As seen in previous studies, the present study shows that energy and nutrient intake were not in compliance with the dietary reference intake and World Health Organization (WHO) nutritional recommendations. Several critical micronutrients, including the intake of magnesium, calcium, vitamin A, vitamin D, vitamin E, folate, iron, calcium, potassium, fiber, and zinc were consumed in low amounts, while sodium and sugar were excessive, following the tendency seen in healthy children in developed countries.[19,29,34,35]

The prevalence of vitamin D deficiency, which was also verified in the present sample, is very high in the HIV-infected population, including in HIV-infected youths.[36-38]

Our patients revealed a low average daily intake of fiber and a negative correlation between higher BMI *z*-score values with low mean values of fiber intake (p = 0.006) was found.

Table 4. Correlation between the body mass index *z*-score and the years since diagnostic and physical well-being with multiple variables

Variables	r_s[a]	*p*
Body mass index *z*-score		
Resistance	-0.405	0.032
Reactance	-0.494	0.008
Fiber intake	-0.482	0.006
Sports activity index	-0.414	0.021
Physical well-being	-0.443	0.012
Psychological well-being	-0.448	0.011
Autonomy and parent relation	-0.569	0.001
School environment	-0.412	0.021
Physical well-being		
Physical activity	0.382	0.034
Sports activity index	0.572	0.001
Psychological well-being	0.735	0.000

rs – Spearman's correlation.
[a] A non-parametric test was used

WHO guidelines for added sugar intake recommends reducing the consumption of free sugars to less than 10% of total energy intake, the subjects of the study presented high values of sugar intake, between 78.1 g and 127.7 g per day,[39] whereas 16% (n = 5) of the subjects consumed the quantity of sugar recommended by the WHO guidelines.

Diet is a modifiable factor and providing nutrition counselling early in the disease process is likely to optimize health and improve long-term outcomes.[1]

Physical activity brings many health benefits such as promoting quality of life and prevents the effects of metabolic and cardiovascular changes, and the WHO recommends at least 60 minutes of moderate to vigorous physical activity for children and adolescents.[40,41] This may be even more important for children and adolescents with an HIV infection because of long-term exposure to combined antiretroviral therapy.[42] Low levels of regular physical activity were described in children and adolescents with an HIV infection.[42,43] Nevertheless, other studies concluded that most children and adolescents had regular physical activity.[43,44]

The results of this study are in accordance with another study, where males have higher mean values compared to females.[43,44]

This study demonstrates a correlation between higher body mass index *z*-score values with low mean values of sports activity index score and a positive correlation between physical well-being and the parameters of physical activity, sports activity index, and psychological well-being.

Optimal health for HIV infected children and adolescents not only refers to the physical well-being, but also includes emotional and social well-being: a good overall quality of life.[45]

Overall, according to the literature, HIV infection is associated with a lower quality of life among children and adolescents, which is consistent with the results of this study. Fewer studies have been performed in HIV-infected children, and in accordance with the adult studies reported lower levels of physical, school, and psychosocial functioning compared to healthy controls.[17,18,46-48]

Health-related quality of life of HIV-infected children and adolescents demonstrated to be an inferior mean compared to studies with healthy children, for all five domains of Kidscreen-27, physical well-being, psychological well-being, autonomy and parent relation, social support and peers, and school environment.[17,18,45,49,50]

The current study shows that the mean health-related quality of life of HIV-infected children and adolescents was lower compared to Portuguese healthy pediatric population.[51] A correlation between higher body mass index *z*-scores values with low scores of physical well-being, psychological well-being, autonomy and parent relation, and school environment was also demonstrated. Children and adolescents are now living with HIV as a chronic disease; in the future, the challenge is to optimize their health status.[17] The increased survival of patients with chronic diseases has brought a more qualitative approach to care, seeking a multidisciplinary approach, with a greater emphasis on their quality of life, physical activity, and nutritional status.

In conclusion, despite the children and adolescents of this study having an unbalanced dietary intake, most presented a normal nutritional status. However, our results demonstrated an increase in the prevalence of overweight and obesity, which is in line with the tendency verified in the combined antiretroviral therapy era. In addition, the subjects follow the trends of healthy children concerning physical activity, but the same is not seen regarding health-related quality of life. Nevertheless, close nutritional intervention and observation must be performed and adjusted to optimize their health status and promote healthy lifestyles, including the dietary intake of macronutrients and micronutrients to avoid long-term comorbidities, such as metabolic and body composition changes, promoting regular physical activity, and helping to ensure a good quality of life.

It is important to emphasize the importance of further studies in European children and adolescents, including a follow-up after the transition to an adult clinic. The present study is one of the few carried out in developed countries. Limitations of this study include the small sample size chosen for convenience. The sample size contributes to the disparate distribution of the sample in the CD4+ classification.

WHAT THIS CASE REPORT ADDS

- This study is the first one including nutritional status, quality of life, and physical activity as evaluation parameters. In addition, it is one of the few studies carried out in developed countries about this theme. With the chronicity of the disease, nutrition-related comorbidities, such as overweight and obesity, are now a reality as well as reduced physical activity.

Conflicts of Interest

The authors declare that there were no conflicts of interest in conducting this work.

Funding Sources

There were no external funding sources for the realization of this paper.

Protection of human and animal subjects

The authors declare that the procedures followed were in accordance with the regulations of the relevant clinical research ethics committee and with those of the Code of Ethics of the World Medical Association (Declaration of Helsinki).

Provenance and peer review

Not commissioned; externally peer reviewed

Confidentiality of data

The authors declare that they have followed the protocols of their work centre on the publication of patient data.

Awards and presentations

The present study was presented in APNEP XX (Associação Portuguesa de Nutrição Entérica e Parentérica). The article won the prize for best oral presentation.

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Estado Nutricional, Atividade Física e Qualidade de Vida de Crianças e Adolescentes com Infeção Pelo Vírus da Imunodeficiência Humana

Resumo:

Introdução: O crescimento e a função imunológica das crianças com infeção pelo vírus da imunodeficiência humana são afetados pelo seu estado nutricional. A maioria apresenta défices nutricionais e desnutrição, no entanto com maior *follow-up*, na literatura têm sido descritos casos de síndrome metabólica. O objetivo do estudo foi avaliar o estado nutricional, atividade física e qualidade de vida em crianças e adolescentes com infeção por VIH.

Métodos: Estudo transversal com uma amostra de 31 crianças e adolescentes com infeção pelo vírus da imunodeficiência humana, avaliadas antropometricamente: peso, altura, índice de massa corporal, prega cutânea tricipital e circunferência do braço. A composição corporal foi medida por bioimpedância elétrica e expressa em massa gorda e massa magra, ingestão dietética *recall* 24 horas, atividade física pelo questionário de atividade física habitual de Baecke e qualidade de vida pelo *Kidscreen-27*.

Resultados: *Z-score* do índice de massa corporal 25% excesso de peso e 7,1% com obesidade. A ingestão dietética de vitaminas, nutrientes, minerais, açúcar e energia não corresponde à ingestão diária recomendada. O questionário de Baecke demonstrou que a atividade física do sexo masculino é maior. Diferenças entre sexos foram encontradas no bem-estar físico ($p < 0,05$) e bem-estar psicológico ($p < 0,05$), sendo que o sexo masculino foi associado a um melhor bem-estar, bem-estar físico e psicológico, autonomia e relação com os pais e apoio social. Valores maiores de *z-score* do índice de massa corporal foram associados a valores mais baixos de resistência, reatância, ingestão de fibra e bem-estar físico.

Discussão: A amostra apresentou uma ingestão dietética desequilibrada. No entanto, a maioria era eutrófica. Os sujeitos seguem as tendências das crianças saudáveis em relação à atividade física, o mesmo não se verifica em relação à qualidade de vida.

Palavras-Chave: Adolescente; Criança; Estado Nutricional; Exercício Físico; Infeções por HIV/complicações; Inquéritos e Questionários; Portugal; Qualidade de Vida