124 - BENEFITS OF THE PRACTICE OF PHYSICAL EXERCISES FOR INDIVIDUALS WITH HIV / AIDS SUBJECT TO TREATMENT WITH ANTIRETROVIRAL

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Abstract: This article is a bibliographical review, where the electronic databases and electronic journals were consulted, such as Bireme and Scielo and the Ministry of Health, in order to verify the benefits that exercise practice Physical activity can bring to individuals living with HIV / AIDS and making use of antiretroviral therapy as well as provide information essential for the prescription of physical activity appropriate for this population. From the studies carried out, it was possible to verify that the resistance training brings numerous benefits to people living with HIV / AIDS, however it was possible to observe that when combined with aerobic training the results are more satisfactory.

Key words: resistance training, HIV, AIDS.

INTRODUCTION

The human immunodeficiency syndrome, AIDS, is the advanced clinical manifestation of the human immunodeficiency virus HIV (LAZZAROTTO; DERESZ; SPRINZ, 2010). HIV can generate clinical manifestations such as: muscular hypotrophy, degeneration of the central nervous system, malignant processes and opportunistic infections (SOUZA, MARQUES, 2009). The main characteristic of the virus is the suppression of immunity, mediated by T cells and that, if unchecked, can inevitably lead to death (LAZZAROTTO; DERESZ; SPRINZ, 2010).

HIV infection and consequently AIDS was discovered in 1981 and its evolution to date has become a landmark for humanity because of the complexity of treatment (GARCIA et al 2014). However, in 1996 Brazil began to distribute antiretroviral treatment free of charge to those who requested it (BRASIL, 2014). According to the Ministry of Health (2016) about 200 thousand people receive the drugs on a regular basis to treat the disease through the Unified Health System (SUS).

According to Lazzarotto (2016), 734 thousand cases of AIDS were registered in Brazil, of which 400,000 are on antiretroviral treatment. In the world, by 2014, 14.9 million people living with HIV / AIDS were registered using combination antiretroviral therapy (ART). According to the Epidemiological Bulletin HIV / AIDS (2015), 206,911 (71.2%) deaths were recorded in Brazil between men and 83,820 (28.8%) among women, ie the sex ratio was 20 deaths among men for every 10 among women.

Combined Antiretroviral Therapy (HAART) is a drug designed to reduce virus replication and contribute to a better quality of life for people living with HIV, but its prolonged use brings some adverse effects (SOUZA, 2009).

Thus, over the years, several scientific studies have been carried out to verify if a well-targeted physical training program can bring benefits to people living with HIV / AIDS, such as: increase in CD4 + T lymphocytes, increase and maintenance of maximum consumption Increase in muscle mass and strength, reduction of fat percentage, improvement in lipid profile, normalization of glycemic index, reduction of coronary risk factors, improvement of self-esteem and quality of life, and Maintenance of viral load (LAZZAROTTO; BAZZO, 2016).

Thus, the objective of this study is to verify the effects that the practice of physical exercise can bring to individuals living with HIV / AIDS and making use of antiretroviral therapy and the relevance of it is to provide information essential for the prescription of physical activity adequate for this Population, through a bibliographic review.

METHODOLOGICAL DESIGN

The present article is characterized as a bibliographic review that according to Botelho; Wedge; Macedo (2011) is also known as a narrative review, which seek to seek a specific subject in the literature collection, usually used by health and education researchers.

A review of the literature was carried out, in which the electronic databases and electronic journals were consulted, such as Bireme and Scielo and the Ministry of Health. In the searches, the following descriptors in Portuguese were considered: Resistance Training; HIV; AIDS; Strength Training. The research of terms / key words was developed through the DeCS (Descriptors in Health Science) from the Virtual Health Library Virtual Database (VHL). The logical operators AND and OR were used to combine the descriptors and terms used to track the publications. In addition, libraries, books and academic works were consulted as potential bibliographical references.

Subsequently, articles were selected, among other bibliographic sources, with the following inclusion criteria: published between the years 2003 and 2016 in Portuguese, carried out in humans of both sexes and age, and articles that analyzed at least one of the outcomes Who were taking antiretroviral therapy when they underwent the tests. Regarding the exclusion criteria, articles unavailable in databases, review articles and studies that did not work with people with HIV / AIDS, or who did not receive antiretroviral treatment were excluded.

RESULTS AND DISCUSSION

1 IMMUNOLOGICAL SYSTEM AND AIDS

On the other hand the innate system is composed of neutrophils, eosinophils, basophils, monocytes and natural Killer cells and by soluble factors: complement system, acute phase proteins and enzymes. The adaptive immune system is characterized by responding to the antigen in a specific way, presenting memory and is composed of B and T lymphocytes (ABBAS et al, 2008). B lymphocytes are responsible for the production of antibodies and are responsible for humoral immunity. On the other hand, T lymphocytes are responsible for cellular immunity (TROMBETA et al 2015).

HIV mainly infects the T lymphocytes inducing helper, which are responsible for modulating the immune response, these cells have a surface phenotypic marker, called CD4 + T cells which are called helper cells. The CD8 + T lymphocytes are responsible for the elimination of the cells infected by microorganisms, so they are called cytotoxic or cytolytic, (LAZZAROTTO; DERESZ; SPRINZ, 2010) image 1 shows in more detail this immune system. Infected, HIV disrupts the immune system and causes a

progressive inoperative, thus causing a picture of immunodeficiency allowing the development of opportunistic infections (BRITO, 2011).

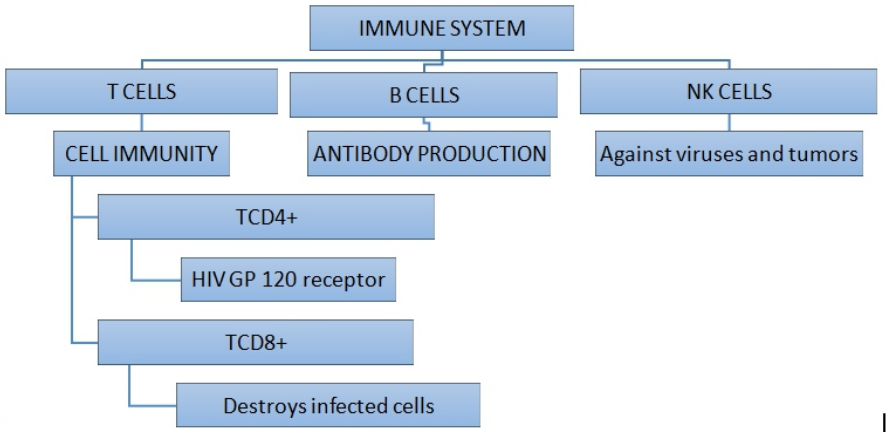

Image 1-Organogram of the immune system:

However, there is a great concern of Physical Education Professionals when it comes to people living with HIV / AIDS in relation to regular physical exercise, because, according to Trumpet (2015), vigorous physical exercise depresses the immune system 72 hours after Its accomplishment. However, this immune system also increases during and immediately after exercise, being greater in the high intensity and long duration effort.

2 HIV REPLICATION CYCLES

The replicative cycle of HIV can be divided into five stages: fusion, reverse transcription, integration, transcription and translation / formation of viral proteins (BRITO, 2008).

In the first step the virus is fused to the host cell membrane after molecular recognition via interactions between the gp41 and gp120 viral envelope glycoproteins and the CD4 receptors and host cell coreceptors. (BRITO, 2011)

In the second step, reverse transcription of the single strand of viral RNA to double-stranded pro-viral DNA catalyzed by the enzyme reverse transcriptase occurs (BRITO, 2008).

In the third step, after reverse transcription, the DNA double-strand incorporation of the pro-viral DNA into the human nucleus occurs, initiating the HIV transcription process in the genome catalysed by the integrase enzyme (BRITO, 2011).

In the fourth step the pro-viral DNA is transcribed into viral RNA, which can be translated into viral polyproteins or in the fifth step to be incorporated into immature viruses, which undergo maturation and budding through the cell membrane. The maturation requires the cleavage of viral polyproteins mediated by the protease enzyme. Mature virions are released into the bloodstream and infect other susceptible cells (BRITO, 2011).

3 BENEFITS OF PHYSICAL TRAINING

HIV infection and the adverse effects caused by long-term use of antiretroviral therapy lead to clinical conditions such as: immunosuppression, functional disability, dyslipidemias, muscular hypotrophy, lipodystrophy, lipohypertrophy, arterio-coronary diseases, type 2 diabetes mellitus, lactic acidosis, depression among Others (LAZZAROTTO; DERESZ; SPRINZ, 2010).

Recent studies have been developed to show how a well-oriented physical training program brings benefits to this population as shown in Table 1.

Table 1. Immunological and physiological results of training in seropositive individuals.

Authors	Sample	Intervention	Results
Brito et al. (2013)	Both sexes Total = 45 Exercise = 23 Control = 22	24 weeks 3x / week Resistances at 80% 1RM	Significant increase in muscle strength and hypertrophy (P < 0.05) and reduction of body fat, fasting glycemia (86.5 ± 18.3 vs. 90.5 ± 12.6), waist circumference (82.0 ± 12.5 vs. 80.6 ± 10.2) and systolic blood pressure (126.3 ± 14.3 vs. 130.0 ± 10.0).
Garcia et al. (2014)	5 men and 5 women (44.7 + - 9.0 years) Total = 10 No control group	20 weeks 3x / week 40 min. Strength exercise. 30 min. walking	Improvement of Vo2max (p = 0.005), increased intra -tissue metabolism of blood lactate in the muscle during passive recovery and improvement of resting blood lactate removal.
Lazzarotto; Bazzo (2016)	Both sexes 18-50 years Total = 7 No control group	12 semanas 3x/semana 20min. Ciclo ergometro 10 min. Ex. resistido a 50% de 15RM	There was no significant increase in body mass, relative VO2 had a significant increase (p = 0.028) and a significant increase in muscle strength, the load (p = 0.034), non significant in TCD8 +, permanence or decrease of viral load, (P = .018), triceps (P = .017) and triceps (P = .017), and Maximum number of sit -ups (p = 0.018).
Mendes et al. (2013)	Men (39.7 + - 9.3 years) and women (38.8 + -11.6 years) Total = 99 Ex. And lip. = 24 Ex. Without lip. = 21 Control and lip. = 27 Control without lip. = 27	24 weeks 3x / week 15-12 min. Cicloergometry from 50 to 80% F.C. reserve 40 min. Ex. Resisted to 80% 1RM	Significant reduction of body perimetry (P <0.0001), mainly chest, neck and waist. Reductions were observed (P <0.0001) for the sum of the seven skinfolds evaluated, percent body fat, fat body mass, total subcutaneous fat, central and peripheral fat. There was a significant increase in the perimetry of the peripheral regions (P <0.0001), an increase in VO2 max and an increase in muscle strength, compared to non-exercise groups (P <0.0001).
Trombetta et al. (2015)	Both sexes (39.75 + - 10.67 years) Total = 12 No control group	16 weeks 3x / week 30 min of resistance training (circuit) 30-40 min. Aerobic.	Increase in TCD4 + cells and maintenance of viral load, increase in VO2max and muscle strength, increase in HDL -c, decrease in fasting triglycerides and increase in blood lactate kinetics.

VO2max: maximal volume of oxygen, MRI: maximal repetition, EX: exercise, LIP: lipodystrophy.

Regarding the elaboration of a program of physical activity for this population, several factors must be considered, such as: medication, symptoms, functional capacity and stage of the disease. As can be seen in Table 1, exercises involving both aerobic and strength components, aiming at improving functional capacity, increasing lean mass and muscular strength should be prescribed (SOUZA, 2009).

FINAL CONSIDERATIONS

From the studies carried out, it was possible to conclude that the resistance training brings numerous benefits to people living with HIV / AIDS, however it was possible to observe that when combined with aerobic training the results are more satisfactory. There was also an improvement in the immunological profile, it was possible to decrease the viral load or to maintain its maintenance in the participants, and it was also able to increase the CD4 + T cell count. Regarding the parameters of the general biochemical

profile, cardiorespiratory fitness and muscular strength, it was observed improvement in important variables such as: increase in HDL-C levels, maximal oxygen consumption, muscle strength, as well as a decrease in glucose and triglyceride levels , Thus ensuring greater independence as well as improvements in health and, consequently, the quality of life of the participants.

Therefore, based on the literature consulted, it is very important to know the clinical condition of the student, so that when prescribing a physical activity program, his or her effort limit is neither overestimated nor underestimated.

REFERÊNCIAS BIBLIOGRÁFICAS

Abbas AK, Lichtman AH, Pillai S. Imunologia: celular e molecular. 6a ed. Rio de Janeiro: Elsevier; 2008.

BOTELHO, Louise Lila Roedesl; CUNHA, Cristiano Castro de Almeida; MACEDO, Marcelo. O método de revisão integrativa nos estudos organizacionais. Gestão e Soc., v. 5, n. 11, p. 121-36,2011.

BRASIL. Ministério da Saúde. Departamento de DST, Aids e Hepatites Virais. Boletim epidemiológico.[Acesso em: 05/mai/2016]. Disponível em: http://www.Aids.gov.br

BRASIL. Ministério da Saúde. Departamento de DST, Aids e Hepatites Virais. Protocolo clínico e diretrizes terapêuticas para manejo da infecção pelo HIV em adultos. Boletim Epidemiológico 2014 [acesso em 08 de maio de 2016]. Disponível em: http://www.Aids.gov.br/pcdt/protocolo-clinico.

BRITO, Monique Araujo de. QSAR-3D de inibidores não-nucleosídeos da transcriptase reversa do HIV-1: estudos independente e dependente da enzima. 2008.

BRITO, Ciro José et al. Impacto do treinamento resistido na força e hipertrofia muscular em HIV-soropositivos. Motriz, v. 19, n. 2, p. 313-24, 2013.

BRITO, Monique Araujo de. Fármacos recentes usados para o tratamento da infecção pelo HIV-1: enfuvirtida, maraviroc, raltegravir e etravirina. Rev Ciênc Farm Básica Apl. n. 32, p.159-68, 2011.

TROMBETA, Joice Cristina dos Santos et al. Parâmetros bioquímicos e cinética de lactato sanguíneo de sujeitos HIV+ submetidos ao treinamento físico combinado. Revista Brasileira de Educação Física e Esporte, v. 29, n. 4, p. 519-534, 2015.

GARCIA, Alesandro et al. Cinética de lactato de sujeitos com HIV após 20 semanas de treinamento físico combinado. Revista Brasileira de Atividade Física & Saúde, v. 19, n. 3, p. 382, 2014.

LAZZAROTTO, Alexandre Ramos; DERESZ, Luís Fernando; SPRINZ, Eduardo. HIV/AIDS e treinamento concorrente: a revisão sistemática. Rev. bras. med. esporte, v. 16, n. 2, p. 149-154, 2010.

LAZZAROTTO, Alexandre Ramos; BAZZO, Karen Olivia. Treinamento concorrente na imunidade e aptidão física de pacientes HIV/AIDS. Revista Brasileira de Medicina do Esporte, v. 22, n. 2, p. 153-156, 2016.

MENDES, Edmar Lacerda et al. Treinamento físico para indivíduos HIV positivo submetidos à HAART: efeitos sobre parâmetros antropométricos e funcionais. Rev. bras. med. esporte, v. 19, n. 1, p. 16-21, 2013.

SOUZA, Hugo Fábio. Benefícios do treinamento aeróbio e/ou resistido em indivíduos HIV+: Uma Revisão Sistemática. Rev. bras. med. esporte, v. 15, n. 6, p. 467-471, 2009.

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Abstract: This article is a bibliographical review, where the electronic databases and electronic journals were consulted, such as Bireme and Scielo and the Ministry of Health, in order to verify the benefits that exercise practice Physical activity can bring to individuals living with HIV / AIDS and making use of antiretroviral therapy as well as provide information essential for the prescription of physical activity appropriate for this population. From the studies carried out, it was possible to verify that the resistance training brings numerous benefits to people living with HIV / AIDS, however it was possible to observe that when combined with aerobic training the results are more satisfactory.

Key words: resistance training, HIV, AIDS.

BÉNÉFICES DE LA PRATIQUE D'EXERCICES PHYSIQUES POUR LES PERSONNES AVEC LE VIH / SIDA SOUMIS AU TRAITEMENT AVEC L'ANTIRÉTROVIRAL

Résumé: Cet article est une revue bibliographique, où les bases de données électroniques et les revues électroniques ont été consultés, comme Bireme et Scielo et le Ministère de la Santé, afin de vérifier les avantages que l'exercice physique peut apporter aux personnes vivant avec le VIH / SIDA Et faisant usage de la thérapie antirétrovirale ainsi que fournir des informations essentielles pour la prescription de l'activité physique appropriée pour cette population. A partir des études réalisées, il a été possible de vérifier que la formation de résistance apporte de nombreux avantages aux personnes vivant avec le VIH / SIDA, mais il a été possible d'observer que, combinés à une formation aérobie, les résultats sont plus satisfaisants.

Mots clés: formation à la résistance, VIH, SIDA.

BENEFICIOS DE LA PRÁCTICA DE EJERCICIOS FÍSICOS PARA INDIVIDUOS CON VIH / SIDA SUJETOS A TRATAMIENTO CON ANTIRRETROVIRAL

Resumen: Este artículo es una revisión bibliográfica, donde se consultaron las bases de datos electrónicas y revistas electrónicas, como Bireme y Scielo y el Ministerio de Salud, para verificar los beneficios que ejercen la práctica de la actividad física para las personas que viven con el VIH / SIDA Y haciendo uso de la terapia antirretroviral, así como proporcionar información esencial para la prescripción de actividad física apropiada para esta población. A partir de los estudios realizados, se pudo verificar que el entrenamiento de resistencia trae numerosos beneficios a las personas que viven con el VIH / SIDA, sin embargo se pudo observar que cuando se combinan con entrenamiento aeróbico los resultados son más satisfactorios.

Palabras clave: entrenamiento de resistencia, VIH, SIDA.

BENEFÍCIOS DA PRÁTICA DE EXERCÍCIOS FÍSICOS PARA INDIVÍDUOS COM HIV / SIDA SUJEITOS A TRATAMENTO COM ANTIRRETROVIRAL

Resumo: Este artigo é uma revisão bibliográfica, onde foram consultadas as bases de dados eletrônicas e revistas eletrônicas, como Bireme e Scielo e o Ministério da Saúde, para verificar os benefícios que exercem a prática A atividade física pode trazer a indivíduos vivendo com HIV / AIDS E fazendo uso da terapia anti-retroviral, bem como fornecer informações essenciais para a prescrição de atividade física adequada para esta população. A partir dos estudos realizados, foi possível verificar que o treinamento de resistência traz inúmeros benefícios para as pessoas vivendo com HIV / AIDS, porém foi possível observar que quando combinados com treinamento aeróbio os resultados são mais satisfatórios.

Palavras-chave: treinamento de resistência, HIV, AIDS.