

AIDS and nutrition in patients

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ABSTRACT

Introduction: AIDS is a viral infection that particularly affects the nutritional status of patients by complicating the absorption of nutrients and their metabolism.

Purpose: The purpose of this retrospective study is to highlight the contribution of nutrition to the wellness of people with HIV in all stages of the disease.

Review Methods: The methodology used to select the information used in this study includes review studies and research in leading databases such as PUBMED, MEDLINE, and IATROTEK. The selection criterion of the articles was the Greek and English language.

Results: The real goal of the nutritional assessment of patients with AIDS is to improve their ability to consume a sufficient quantity and variety of foods in order to meet their nutritional needs. The evaluation of dietary intake assesses the adequacy of food and nutrients consumed. It includes assessing the dietary patterns, frequency of meals, and the factors that affect food choice.

Conclusions: Maintaining a good nutritional status has a significant impact on the functioning of the immune system and the overall health of people living with HIV / AIDS.

Key words: AIDS, nutrition, immune system infection, immunosuppressant

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INTRODUCTION

In 1983, HIV was first isolated by Francis Barre-Sinonousi and Luc Montagnier at the Pasteur Institute in Paris on suspicion that it could be the cause of AIDS. This initial discovery was confirmed a year later by researchers at the National Institutes of Health, headed by Robert C. Gallo [1].

In 1986, the International Commission on the Classification of Viruses attributed the name human immunodeficiency virus (HIV) to the retrovirus. Globally, it is estimated that 35.3 (32.2 to 38.8) million people were living with HIV in 2012. There has been an increase in people receiving antiretroviral therapy from previous years; an overwhelming number of men, 31.8 million, compared with women, 16 million. New infections have dropped by 33% since 2001, with the reduction being more pronounced among children. At the same time, the number of deaths from AIDS has also decreased from 2.3 million in 2005 to 1.6 million 2012 [2, 3].

In 1987, the first antiretroviral agent, AZT (zidovudine), was launched as a treatment for HIV. Even though the long-term viral suppression treatment doesn't cure HIV, it still provides temporary relief from symptoms and clinical manifestations by slightly delaying the onset of AIDS [4]. Although the introduction of highly active antiretroviral therapy (HAART) in the mid-1990s until today has led to a significant reduction in morbidity and mortality, a complete elimination of the virus has not been achieved. It is estimated that HAART has reduced mortality by 80% in industrialized countries [5].

Deaths from AIDS have declined by 30% from 2005, when it was recorded and was the highest percentage in history. The total number of people who have died from AIDS rose then to 30 million [6].

In 2012, about 9.7 million people with HIV had access to antiretroviral therapy in low- and middle-income countries, which represents 34% of people that received treatment, according to 2013 WHO guidelines [6].

It is estimated that the average time from the moment of infection with the virus until death is 9.4 years for patients who do not receive any kind of treatment. However, there is a very small percentage (<1%) of patients who are able to suppress the virus naturally without the use of antiretroviral drugs [7].

The onset of AIDS is characterized by the collapse of the immune system after a long asymptomatic period. CD4 cell levels continue to fall (<200 cells / ML) to levels that can increase the risk of opportunistic infections by bacteria, viruses, fungi, and parasites such as *Microcystis Carinii*,

cytomegalovirus and enteropathic parasites, which could be threatening life diseases [8].

Nutrition has always been an important aspect of HIV care. Maintenance of a good nutritional status has a significant impact on the functioning of the immune system and the overall health of people living with HIV / AIDS [9].

The purpose of this study is to highlight the contribution of nutrition to the wellness of people with HIV in all stages of the disease, helping patients with AIDS to live a long and healthy life.

MATERIALS AND METHODS

The study material consisted of recent articles on the subject that were found mainly in the electronic database Medline and the Association of Greek Academic Libraries (HEAL-Link), with the following keywords: diet, HIV, and nutrition intervention. The exclusion criterion for articles was a language other than Greek or English.

Generally about AIDS

AIDS is an abbreviation of the English scientific term «Acquired Immune Deficiency Syndrome». It is a viral infection that can lead to serious and currently irreversible damage to the immune system [10].

The classic definition of AIDS includes patients with a definite diagnosis of opportunistic infection (pneumonia *Karinio Pnemonysti* (PC) is the most typical) or with a tumor (mainly Kaposi's Sarcoma (KS)), which is a sufficient indicator of cellular immune deficiency, but with no other known causes or factors responsible for the immune deficiency [11].

A disease carrier is a person who is infected with the virus but not yet sick (that does not show any symptoms), also might be called HIV (+) person or HIV seropositive. This person transmits the virus to others through sex, blood, or birth [12].

Concerning the complications of the disease, malnutrition is a major complication of HIV infection, and has been recognized as an important predictor of the disease. Even if malnutrition occurs more often at the final stage of the disease, it can also occur at its onset, before severe immunosuppression is triggered [13].

Malnutrition is described as an imbalance between intake and the body's needs that leads to metabolic disorder, decreased body function and body mass loss, or as a state of nutrition in which a deficiency or imbalance of energy, protein and other nutrients causes measurable negative effects in tissues and / or body shape [14].

Moreover, the virus particularly affects the nutritional status of the patient, increasing the energy requirements, and negatively affecting the absorption of nutrients and metabolism, which lead

to cytokine activity and diarrhea [15]. Malnutrition enhances the viral effects in the person by weakening immune response and worsening immunosuppression, which adversely affects the overall outcome of the disease [16].

Diet of patients with AIDS

The goal of nutritional assessment is to understand the patient's nutritional status in order to develop a nutritional care plan that should consist of nutritional goals, nutritional services, and medical care. Nutritional assessment involves gathering information about the socio-economic characteristics, medical history, eating habits, anthropometric, clinical, and biochemical measurements, and current treatment [17]. The assessment of dietary intake evaluates the adequacy of food and nutrients consumed. It includes evaluating the dietary patterns, frequency of meals, and factors affecting food choice. The real goal is to improve the AIDS patient's ability to consume a sufficient quantity and variety of foods that covers their nutritional needs [18].

There are a number of factors that influence the nutritional needs of people living with HIV e.g. age, physical activity, clinical stages of health, metabolism, and viral load. For example, the absence or presence of symptoms such as fever, diarrhea, weight loss, and wasting can alter appropriate uptake. People with HIV need a diet that will provide them with nutrients that meet their increased nutritional needs [5].

People with HIV have higher energy requirements. While there is no definitive answer regarding the appropriate increase of energy intake, there is strong justification for increasing energy intake for those at an advanced stage or for supporting medical interventions [19].

There is no evidence for increased protein requirement above and beyond that required in balanced nutrition to meet total energy needs. For the nutritional care of people with HIV and infectious diseases, the goal for protein intake should be 1.2 g/kg of body weight per day in the stable phases of the disease, and can be increased to 1.8 g/kg in acute situations [20].

The recommended intake of fat is the same as for uninfected individuals, specifically no more than 30-35% of total energy needs. However, HIV patients who take certain antiretroviral drugs or with certain infection signs, such as diarrhea, may require changes in the time or amount of fat intake [21].

Also the use of vitamins and mineral supplements is considered a popular adjunctive therapy [22]. Vitamin A supplement administration has been shown to reduce diarrhea-associated mortality [23]. But also vitamin E supplements (800 mg/day) reduce oxidative stress, promote the

reduction of viral load, and may enhance cell viability in individuals receiving anti-retroviral therapy [24]. Vitamin D supplements may also provide additional benefits regarding the reduction of HIV transmission, disease evolution, and immunological benefits [25]. It should be noted that taking vitamin D and calcium supplements prevents the appearance of secondary hyperparathyroidism that usually occurs in HIV patients treated with Tenofovir [26].

Furthermore, the physical, psycho-social and environmental context in which people with HIV live may affect their nutritional status [27]. For example, an HIV patient suffering from occasional infections may show difficulty in buying, preparing and consuming food while poverty, lack of refrigeration or lack of appropriate facilities may limit food choice. The amount of food consumed can also be limited by factors such as substance/alcohol abuse, depression, or senile dementia [18].

Nutrition counseling of patients with AIDS

The goal of nutritional intervention is the prevention or inversion of weight loss. This is achieved by improving appetite and nutrient absorption, treating all the direct causes of anorexia and malabsorption such as mouth ulcers and diarrhea, improving the intake of calories from high fat diets in protein and low fat content, with or without adding micronutrient supplements and by rectifying psychosocial problems such as poverty and depression by providing social and psychological support [28].

The supply of nutrients through diet or parenteral nutrition can reverse metabolic disorders. However, in the wasting syndrome associated with AIDS, dietary intervention is not effective until the underlying causes of wasting are corrected [29].

Nutritional counseling is vital to ensure that patients have balanced nutrition, paying special attention to macronutrients and micronutrients. The goal of dietary counseling is to improve food quality in order to cover the required needs for energy, protein and minerals, as well as to increase intake due to changes in REE [30].

Finally, general dietary recommendations should be provided to patients so that they can overcome the various problems affecting food intake and consequently weight [31]. It is useful for patients to keep a detailed diary of foods, drinks and snacks consumed in order to assess their nutritional status [32].

Patients may benefit from small frequent meals with foods of their choice while large portions may discourage intake [5]. Pureed foods and liquids are indicated in patients with dysphagia. In patients with nausea and vomiting symptoms, the consumption of small and dry meals, without a

strong flavor, is recommended [33]. In people with diarrhea, a lactose-free diet, low in fiber and semi-solid foods is recommended [34].

CONCLUSIONS

Diet has always been an important aspect of HIV care. The treatment of people with HIV infection should include the optimum dietary intervention in order to help them live a long and healthy life [35]. Maintaining a good nutritional status has a significant impact on the functioning of the immune system and the overall health of people living with HIV/AIDS [36]. It has also been suggested that good nutrition can contribute to the wellbeing of people with HIV at all stages of the disease and may even extend life expectancy [37].

There are several tools that are used to make dietary intake assessments, such as: food diaries, dietary history, and the 24-hour recall and food frequency questionnaire. The method should be chosen according to the particular characteristics of the patients. It is better to use a combination of methods that will adequately reflect normal intake, dietary preferences, food intolerances, and any changes that may undermine the nutritional intake of each patient.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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