Nutrition and Exercise to Improve the Health and Quality of Life of People Living with HIV/AIDS

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People Living with HIV/AIDS

People with HIV/AIDS need to eat a consistent amount of food, which helps to sustain lean body weight.

A balanced diet should include moderate protein and unprocessed vegetables, fruits, nuts, whole grains, and good sources of polyunsaturated fats.
People Living with HIV/AIDS

A consistent and intense exercise program will help build and maintain muscle and a desired level of cardiovascular fitness.

A combination of weight training, cardiovascular conditioning, and stretching are components of a complete exercise program.
What are some of the key factors that impact nutritional status?

**Food security** – “The access by all people at all times to sufficient food for an active and healthy life; containing a ready availability of nutritionally adequate and safe foods, and an assured ability to acquire acceptable foods in socially acceptable ways” (1).

**Nutrition security** – “The provision of an environment that encourages and motivates society to make food choices consistent with short- and long-term good health” (2).

Food and Nutrition Insecurity

Linked worldwide to the transmission of HIV and poor outcomes related to HIV disease (1).

Can lead to survival strategies that can expose populations to a greater risk of HIV infection, such as migration to urban slums and involvement in the sex trade, and can increase the vulnerability to the progression of HIV disease to AIDS (2).

The result can be the initiation or exacerbation of malnutrition.


“All dimensions of food security, availability, stability, access, and use of food, are affected where the prevalence of HIV/AIDS is high” (1).

A large number of people living with AIDS face hunger and multiple barriers to food and nutrition security, such as financial hardship, stigmatization, incarceration, inadequate cooking skills, and co-morbidities, such as mental illness (2).

Food represents more than a vehicle to deliver nutrients, and having food security includes being able to access food with dignity.

Clinical Issues Related to Nutrition

Nutrition-related deficiencies that affect immune system functioning can include antioxidant depletion and protein and energy inadequacy.

Proper calorie, protein, and micronutrient intake is necessary to maintain and restore malnutrition-related immune dysfunction (1).

Protein may be particularly important to maintaining cellular functioning and normal physiology, including immunity (2).


A proper supply of nutrients is necessary for general physiological functioning, but is also necessary for cytokine production and immune processes.

While some particular micronutrients, such as selenium, have been found to be important for immune functioning (1), other data suggest that general malnutrition may more thoroughly explain immune system dysfunction (2).

Clinical Issues Related to Nutrition

An HIV+ person who is well-nourished with a controlled viral load is more likely to withstand the effects of HIV.

Diets high in both calories and protein may be required to improve the body’s response to the challenge of symptomatic HIV infection (1, 2).

However, macronutrient and micronutrient needs may increase significantly with one of these factors: a high viral load associated with a decline in immune function, ineffective treatment regimens, viral resistance, and/or active secondary infections.


It is important to consider the efficacy of antiretrovirals and other medications on patient nutritional status (1).

Nutritional status can affect medication absorption, use, elimination, and tolerance (2).

These medications will likely always be required for continuous disease management and present challenges to nutritional status maintenance by introducing potential interactions with food, body metabolism, and side effects.


Nutritional Assessment

Nutritional changes likely occur early in HIV infection, so assessing nutritional status and intervening appropriately should begin soon after diagnosis.

The negative effects of malnutrition are often preventable, but are usually not easily reversed.

Co-morbidities that have nutritional implications include renal disease, hepatitis, pulmonary diseases and tuberculosis, diabetes, cardiovascular disease, neurological diseases, cancers, and osteoporosis.
The Use of Nutritional Supplements

The use of macronutrient and/or micronutrient supplements may be more than 50% of the HIV/AIDS population (1, 2).

In addition, potential antiretroviral medication interactions with other medications, food, nutrient supplements, and herbs should be considered in nutritional evaluations.

Specific nutrients of interest include, but are not limited to: vitamins A, B6, B12, and D; folate; carotenoids; selenium; and zinc (3).

General Recommendations

People living with HIV require a proper understanding of nutrition to maintain a healthy body weight.

At minimum, they should understand the need to reduce their intake of saturated fat, trans-fatty acids, salt, and dietary cholesterol.

Clients with hypertriglyceridemia would benefit from increasing fiber intake, limiting simple carbohydrates, and avoiding alcohol (1).

General Recommendations

Maintain an optimal weight and prevent rapid weight loss.
Reduce or discontinue smoking (all tobacco use), alcohol, and caffeine consumption.
Eliminate the consumption of foods and beverages high in phosphoric acid by choosing calcium rich beverages (e.g., fortified soy beverages) instead of high phosphorous carbonated beverages and eating a variety of protein foods (1).

Physicians should adjust HAART to minimize nutritional and other side effects.

Eat calcium-rich and vitamin D-fortified foods and supplementing with 500 to 1,200 mg/day calcium (1). An equal amount of magnesium should be consumed to ensure proper assimilation.

Vitamin K, vitamin C, and zinc are also important for bone formation and should be recommended as well (2).

Additional Considerations for Children

HIV+ Children have the same nutrition issues as HIV+ adults, but issues related to growth and development make nutritional inadequacies even more devastating.

Poor and/or inadequate nutrition may stunt growth, render a normal weight unreachable, cause a failure to thrive, impair neural development, and result in wasting in HIV+ children (1).

Physical Activity

AIDS can now present as a chronic illness with an uncertain natural disease history.

The potential exists for a greater prevalence and impact of disability in people living with HIV/AIDS.

Exercise is a key management strategy to (1):
- Address impairments (e.g., problems with body function, pain, or weakness)
- Activity limitations (e.g., inability to walk)
- Participation restrictions (e.g., inability to work)

Effects of Exercise

Exercise can be used to address unwanted increases in weight and body fat related to the consequences of the use of HAART and from HIV infection itself (1).

Other improvements due to exercise include muscle strength and flexibility, cardiopulmonary fitness, and decreases in depression, anxiety, and anger (2, 3).


Effects of Exercise

Regular exercise has been found to slow down the progression of HIV and increase CD4 cell count.

One study showed that HIV patients exercising 3-4 times per week were less likely to develop AIDS than those carrying out daily exercise (1), revealing a need to slightly limit the amount of physical activity for people with HIV.

Keep in mind that the WHO’s general recommendation is for one hour of moderate exercise per day for the prevention of chronic disease (2).

Effects of Exercise

Progressive resistance exercise (i.e., weight training) or a combination of progressive resistance exercise and aerobic exercise at least three times a week for at least four weeks appears to be safe and may lead to clinically important changes in body weight and composition for adults living with HIV/AIDS who are medically stable immunologically and virologically (1, 2).


Effects of Exercise

Exercise has shown efficacy in improving the restoration of lean tissues and has been recommended as an adjunctive therapy to improve body shape alterations and metabolic alterations such as insulin resistance (1, 2).

Increases in weight-bearing exercise and lean body mass may help to stimulate bone formation (3).

Summary of Benefits

These studies indicate that moderate levels of physical activity are safe and beneficial in the short term for individuals infected with HIV.

Questions remain regarding the results of exercise regimens and physical activity structured over years after a positive diagnosis of HIV.

Progressive resistance training should be particularly important, in light of wasting still being a problem for persons with HIV.
Exercise Recommendations

The person’s frequency and intensity of exercise will have an impact on the level of wasting, alterations in body fat deposition, and other long-term complications of HIV disease and treatment.

When recommending exercise, limitations should be considered, including barriers such as peripheral neuropathy, pain, and fatigue.
Exercise Recommendations

Taking into considerations any limitations, persons living with HIV/AIDS should engage in at least 3.5 hours of physical activity per week, ideally spread over 3-5 days.

1. Activities that are *liked* should be picked to increase adherence.
2. Exercising all muscles is very important.
3. Choose moderate kinds of activity, like brisk walking.
4. Work up to the goals *slowly* without experience in a regular exercise program.
Exercise Recommendations

Four Primary Components of Designing an Exercise Program:

1. Frequency: How many days per week?
2. Intensity: What percentage of maximal heart rate?
3. Duration: How long in a given bout?
4. Mode: What type of exercise?
Other Considerations:

1. Along with resistance training and cardiovascular conditioning, stretching should also be incorporated into the program.
2. Hydration is important to maintain homeostasis and recovery.
3. Post-exercise supplementation with carbohydrates and protein maximize recovery.
Some Areas of Needed Research

Investigating the role of supplementation and/or weight training activities on bone mineral density because of the negative consequences of HIV itself and HAART.

For those on HAART, the relationship between high-protein diets and the risk of heart disease, various forms of cancer, osteoporosis, and arthritis.

Examine the necessary dosages of micronutrient supplementation among HIV+ individuals at various stages of disease and treatment.
The Best Overall Approach

Goals for nutrition and exercise interventions are individualized according to the problems identified.

Among these goals are achieving healthy body weight, body composition, and laboratory values, e.g., lipids, albumin, Vitamin B12, glucose, C-reactive protein.

Other goals include a reduction in nutrition-related side effects and complications, increased fat free mass to combat wasting, enhanced quality of life, and expanded access to dietetic and exercise services.
Thank you for your attention!