Exercise and Positive Living in Human Immunodeficiency Virus/AIDS

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KEYWORDS

• Physical activity • Fitness • Exercise • Stress • HIV

KEY POINTS

- Exercise can be both safe and beneficial for this clinical population, making it imperative to determine successful motivational and behavioral-changing interventions aimed at increasing physical activity.
- Routine physical activity has shown to reduce daily stress and circulating cortisol in as few as 3 weeks among people living with human immunodeficiency virus (HIV)/AIDS.
- Individuals do not necessarily have to work at a vigorous intensity level to achieve significant health benefits as long as they stay consistent with their exercise plan.
- The important takeaway regarding exercise and the immune system is that research among HIV populations has demonstrated that exercise performed at low, moderate, or high intensity does not negatively impact immune function or disease progression in HIV-infected individuals.

INTRODUCTION

It was not until long after Plato once said "Lack of activity destroys the good condition of every human being, while movement and methodical physical exercise save it and preserve it" that exercise science and the field of epidemiology began getting the world's attention regarding the health benefits of physical activity and its overall importance to stay mobile. Even though it may have taken more than 3000 years for most of the world to take these words seriously, scientific discoveries on the topic have exploded since the mid-1900s. With regard to the relevance on public health, the biggest strides have been made with the general population in relationship to risk of chronic diseases, as well as some clinical research in areas like cardiovascular

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disease and rehabilitative physical therapy following injury. The irony of this research with clinical populations is that had they been physically active beforehand, that injury or heart attack may have been prevented in the first place. However, not all clinical populations are diagnosed with a disease that could have been prevented by physical activity, diet, or other healthy lifestyle factors.

Some chronic conditions, like viral infections, are facing a multitude of problems from a diagnosis that could have occurred no matter how physically fit or health conscious the individual was 99% of their lives. One such condition, such as human immunodeficiency virus (HIV), is accompanied by a lifetime of medications known to disrupt metabolic processes, creating a metabolic syndrome–like condition. Many of these metabolic disruptions are known to increase one's risk for chronic diseases but evidence would suggest they could possibly be offset by maintaining an active lifestyle. With weekly exercise regimens prescribed as a form of complementary treatment, this in turn could help reduce the risk of chronic disease and mortality for people living with HIV/AIDS (PLWHA). Although we have strong evidence demonstrating the clear benefits of exercise in the general population, whether the same level of benefit is possible among individuals living with HIV remains less clear. What we do know with regard to the benefits of exercise for PLWHA is discussed in this review of the literature from research conducted since the beginning of the epidemic. This in turn will lead into a brief discussion about psychoneuroimmunology (PNI) theory and the interconnections of the mind, body, and one's self.

EXERCISE AND HUMAN IMMUNODEFICIENCY VIRUS: THE KNOWN BENEFITS

Exercise is defined as a "type of physical activity consisting of planned, structured, and repetitive bodily movement done to improve and/or maintain one of more components of physical fitness."[1] It is important to note that "exercise" by definition does not need to begin immediately for PLWHA to gain mental and physical health benefits. Recent evidence would suggest simply an increase in daily physical activity by adding more steps per day can have a significant impact on waist circumference and activities of daily living.[2] Short-term goals, like an increase in daily steps, is a great way to begin implementing positive habits that will improve health and quality of life without the need for 150 minutes of moderate-intensity exercise every week. Obviously, that would be the ultimate long-term goal for every person wanting to live a longer, healthier life, but for someone who has been primarily sedentary for a prolonged period, like most people with HIV, starting with a more realistic approach of just walking more could prove beneficial. What makes this of even greater importance is the known associations between cardiorespiratory fitness (CRF) and all-cause mortality. Research has suggested individuals with lower CRF are at an increased risk for cardiovascular disease (CVD), stroke, hypertension, diabetes, cancer, all-cause mortality, and many more chronic conditions.[3–5]

People of all ages infected with HIV have abnormally low levels of CRF.[6–12] These reductions have been attributed to sedentary behavior and lifestyle habits. Further, PLWHA often exhibit a maximal V_{O_2} of 24% to 44% below their age-predicted normal values.[6–12] CRF, as determined by maximal V_{O_2}, is a powerful predictor of all-cause and CVD mortality and of type 2 diabetes mellitus.[3,5,13,14] Evidence from clinical exercise investigations would suggest that a moderate-intensity physical activity regimen can produce adaptations leading to an increased CRF.[6,13–15] These investigations are severely limited considering they range from only 6 to 12 weeks, use various training protocols rarely mimicking that of others, and most importantly there is a lack of larger trials or even longitudinal investigations that incorporate physical activity as a regular