

Position Paper on Malnutrition, Adjuvant Nutrition Therapy, and the Need for Nutrition Research for Populations Confronted with HIV/AIDS

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Introduction

Good Morning. My name is Bernadette Marriott and I am a scientist at RTI International¹, headquartered in Research Triangle Park, North Carolina. The following statement is also officially endorsed by the American Society for Clinical Nutrition², of which I am a member.

Position

Malnutrition can have devastating effects on the immune system thereby exacerbating HIV/AIDS and increasing the risk of opportunistic infections. While new pharmaceutical therapy can dramatically change the life course for persons with HIV, research has consistently demonstrated that administration of specific supplemental nutrients can enhance the effectiveness of antiretroviral drug treatment for HIV by addressing malnutrition and helping to rebuild the immune system. All HIV treatment programs should include nutritional assessment, dietary counseling to combat malnutrition and, where deficiencies are present, provision of specific nutrient supplements as an inexpensive adjuvant therapy to antiviral drugs. To extend the promising benefits of nutrition therapy, more research should be conducted on the role of nutrition in HIV/AIDS, the interaction of nutrition with specific HIV/AIDS drug therapies, and the impact of the virus on nutrient uptake and metabolism.

Background

Malnutrition typically is the backdrop to HIV/AIDS throughout the world (1, 2, 3). In Africa where 80 percent of the population depends upon subsistence agriculture, as many as 60 to 70 percent of the farms have experienced HIV/AIDS-related reductions in worker capacity resulting in decreased production and food insecurity, defined as

¹ RTI is a not-for profit organization dedicated to conducting innovative, multidisciplinary research to improve the human condition. RTI was founded in 1958 and currently has a worldwide staff of over 2,300 actively working in fields such as health and medicine, environmental protection, education, governance, technology commercialization, and decision support systems.

² The American Society for Clinical Nutrition (ASCN), founded in 1959, is the premier scientific society for clinical nutritionists in medicine and the health sciences. Its mission is to promote human/clinical nutrition research, education and patient care to enhance health and to prevent and treat disease. In addition, ASCN is involved in promoting the proper application of the findings of nutrition research to the practice of medicine and related health professions and to provide reliable clinical nutrition information to the professional community and the public. Our journal, *The American Journal of Clinical Nutrition*, has the highest impact factor of all peer reviewed nutrition and dietetics journals.

hunger and undernourishment. In many countries women are the primary agricultural producers as well as caregivers (4, 5). In Malawi 87 percent of the households where a woman dies experience a food gap but in households where an adult male dies only 38 percent experience a food gap (4). Hunger is increasingly forcing women in these countries to embrace high-risk survival strategies such as prostitution to obtain money for food and forcing children to abandon schooling in order to obtain and provide food for their families (4, 5). The Joint United Nations Programme on HIV/AIDS (UNAIDS) recently estimated that there were 40 million people living with HIV/AIDS, comprised of 37 million adults and 2.4 million children under the age of 15. During 2003 it is estimated that 5 million people acquired HIV while AIDS led to the death of 3 million individuals (6). In countries where food is lacking or food prices are not affordable the prevalence of HIV is extremely high, ranging from 15 percent in Malawi to 33 percent in Swaziland (4).

Recent reports from prominent conferences on HIV/AIDS have called for increased attention to food security, malnutrition, and nutritional assessment in populations confronting HIV (7, 5). In 2003 FAO and WHO jointly published a manual that recognizes the relationship between nutrition and immune function and provides practical solutions to caregivers and communities to help with diet and easing the symptoms of AIDS. WHO currently is developing norms and standards to help government agencies produce guidelines on nutritional care and support for persons living with HIV/AIDS (8).

Malnutrition can have a severe and even devastating impact on the specific antigen-antibody components of the immune system and can also compromise more general bodily defense mechanism (9). If exposed, persons who are malnourished are more likely to contract infectious diseases such as HIV. Scientists refer to the vicious cycle of malnutrition, particularly micronutrient deficiencies, nutritionally related immunosuppression, and oxidative stress that leads to accelerated progression of HIV/AIDS (9, 10). For example, in homosexual men the risk of progression to AIDS was increased twofold in persons with vitamin B₆ deficiency (11). Low vitamin A blood levels have been associated with higher vertical transmission of HIV, increased mortality and accelerated HIV disease progression (12, 13, 14). In HIV-infected infants in Uganda, low plasma carotenoid levels have been associated with increased risk of death (15).

Regardless of an individual's pre-disease nutritional status, once HIV is contracted, the disease itself begins to impact nutritional absorption leading eventually to symptoms such as loss of appetite, weight loss, fatigue, and nutritional imbalance. HIV specifically is accompanied by diarrhea and malabsorption of vitamin B₁₂, fats, and carbohydrates (10, 16, 17, 18, 19). The malabsorption of fats thereby can reduce the absorption of fat soluble vitamins such as vitamins A and E. This disease-induced malnutrition leads to further immune system decline and increases the risk for opportunistic infections, including tuberculosis (2, 20) and potentially increases HIV seroconversion (21).

Research has continued to elucidate the basic biology of HIV infection but significantly fewer studies have been focused on the importance of micronutrient deficiencies and

HIV/AIDS. Data shows that the identification and treatment of micronutrient deficiencies can play a critical role for prolonging life for persons with HIV/AIDS. For example, multivitamin and vitamin A supplements improve weight gain during pregnancy in HIV-1 infected women (22). Vitamin A supplementation alone has been demonstrated to increase birth weight and decrease anemia in infants born to HIV-infected women (23). While the mechanism is not completely understood, it appears that positive plasma selenium levels are associated with a reduced the risk of mycobacterial infections in HIV-1 infected drug users using highly active antiretroviral therapy (15). A decrease in viral load and a reduction in oxidative stress were reported with provision of supplemental vitamins E and A in HIV-infected adults in Canada (24). Key research has shown that supplemental B₁₂ can significantly reduce the risk of AIDS dementia complex (25, 26). These results present the importance of assessing the nutritional health of the HIV patient and for providing supplemental nutrients as adjuvant therapy to pharmaceuticals to improve health, quality of life, and outlook regarding opportunistic infections (7).

The importance of good nutrition for a healthy immune system has been a known scientific fact for decades yet relatively little research can be annually devoted to understanding the basic scientific mechanisms underlying this relationship. Even with the AIDS epidemic, little research has been systematically targeted to study the relationship between HIV and important nutritional areas such as nutrition status of the individual, the impact of the disease on nutrient uptake and availability, supplemental nutrients and disease progressions, and specific drug/nutritional health interactions. In locations where highly active antiretroviral therapy (HAART) is available and HIV patients are living longer, weight loss and wasting continue to be problematic in persons taking HAART(27) and new medical complications such as HIV-associated lipodystrophy syndrome are emerging that require study and the development of effective management strategies (28). As Dr. Graeme Clugston, Director of WHO's Department for Nutrition in Health and Development, recently emphasized there is a tremendous the need to focus on the role of nutrition on HIV/AIDS and HIV/AIDS on nutrition (5).

In medicine the leap from the lab bench to the bedside is often a long one. In the case of nutrition and persons confronted with HIV, this leap needs to be taken NOW to optimize the health outcomes of important interventions, such as the President's Emergency Plan for AIDs Relief, and other major global and domestic programs to combat HIV/AIDS.

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