

Short Communication

## IMPORTANCE OF VITAMIN AND MINERAL SUPPLEMENTATION IN HIV/AIDS PATIENTS TO IMPROVE THEIR NUTRITIONAL AND IMMUNOLOGICAL STATUS

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### SUMMARY:

Nutrition intervention aimed at preventing or reversing weight loss and wasting in HIV infection may help to improve quality of life and prolong survival. Micronutrient supplementation may help to strengthen the immune system and reduce the severity and impact of opportunistic infections in people living with HIV/AIDS. HIV contributes to malnutrition for physiological reasons related to the infection itself. HIV/AIDS, being a disease of the immune system, new strategies, including specific dietary nutrients (nutrient supplementation) to improve immune functions, quality of life and prolong survival in infected individuals, could provide additional/alternative approaches for therapeutic treatment in HIV infected subjects. Several vitamins and minerals are important in fighting HIV infection and its resultant effects, hence nutritional supplementation has been advocated. This review focuses on the importance of vitamin/mineral supplementation in HIV/AIDS subjects.

**KEY WORDS:** Vitamin, mineral, supplementation and HIV/AIDS.

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### INTRODUCTION

Few people, whether or not they are nutritional professionals would dispute the fact that malnutrition constrains people's ability to fulfill their potential. The Joint FAO/WHO Food Standards Programme and the Codex Alimentarius Commission (CAC) were established in 1962 in response to worldwide recognition of the need to ensure the quality and safety of the world's food supply. The effect of HIV (human immunodeficiency virus) on the

nutrition of a person follows a number of paths. Health and nutrition depends on the stage and the severity of the infection. It is known that good nutrition in terms of quality and safety can contribute to the well-being of people living with HIV/AIDS at all stages of the disease and may even prolong life. As a result of malabsorption, the blood micronutrient levels of people living with HIV/AIDS are often lower than those without the infection or syndrome. However, determining the micronutrient status of these subjects is difficult, since infection causes shifting of some nutrients between blood and tissue fluid; consequently micronutrient deficiencies can be caused by malabsorption in addition to poor dietary intake or increased nutritional demand.

### *Aims of nutritional intervention*

The aims of nutritional intervention in HIV/AIDS patients are:

(a) to minimize loss of lean body mass

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- (b) to prevent vitamin and mineral deficiencies
- (c) to surmount obstacles to nutrient intake and absorption and
- (d) to prevent or moderate the use of nutritional methods that may not enhance the well-being of the patients.

It is important for healthcare professionals caring for HIV-infected individuals to understand the relationship between nutrition, HIV infection and immune system. It is against this background we aimed at highlighting this relationship using supplementation as a factor. Many clinicians support the use of dietary supplements by people living with HIV/AIDS, except when they consider the intake dangerous.

It is observed that during active phases of HIV infection, subjects lose weight and lean body mass rapidly. The probability of imminent death is high when their weight fall to 66% of the actual weight or when lean body mass falls to 54%. Although, nutrition cannot single-handedly stop wasting, nutritional intervention/supplementation can reverse immune dysfunction related to malnutrition<sup>1</sup>.

#### *The importance of supplementation in HIV/AIDS patients*

Providing sufficient food and nutrition to meet people's basic needs for health, growth and development has been a long-standing challenge for African people. This challenge is further exacerbated by the emergence of HIV/AIDS. Several vitamins and minerals are critical for fighting HIV infection because they are required by the immune system and major organs to attack infectious pathogens. Research indicates that in the early period of HIV infection, weight or maintenance might be achieved through nutrition and has helped to reduce the consequences of wasting in people living with HIV/AIDS<sup>2</sup>.

Since HIV/AIDS is a disease of the immune system, new strategies, including specific dietary nutrients can be helpful to improve

immune functions, quality of life and thus prolong survival in infected individuals. This could provide additional or alternative approaches for therapeutic treatments in HIV infected individuals. This strategy could also be used in establishing anti-immunity in healthy uninfected persons<sup>3</sup>.

Studies have shown that even people who eat healthy food are likely to have vitamin and mineral deficiencies when infected with HIV. For instance, zinc, selenium, magnesium, carotenoids, vitamins A, E, C, B<sub>2</sub>, B<sub>6</sub> and B<sub>12</sub> have all been found to be low in HIV-infected subjects. This can happen before visible sickness and development of AIDS. The recommended daily allowance for vitamins and minerals are most often not sufficient for people living with HIV/AIDS. Supplementation has been shown to be associated with significant slowing of disease progression. In the developing world, where majority of the people cannot afford antiretroviral therapy, nutrition combined with supplementation form good source of therapy. From the mid 1980s until 1990, multiple deficiencies of vitamins and minerals were documented in people living with HIV/AIDS. Although, at this time, no aggressive supplementation was recommended, however, in a report by FDA (USA), it was suggested that supplementation of vitamins and trace minerals one or two times the recommended daily allowance (RDA) may offset possible deficits and contribute to meeting increased requirements during hypermetabolic states. Dwyer et al.<sup>4</sup> reported that multivitamin supplements might be helpful for debilitated AIDS patients who suffer from malabsorption. Malnutrition is almost universal among people living with HIV/AIDS, hospitalized or not, largely because of AIDS-related malabsorption. Malnutrition favours opportunistic infections and contributes to wasting.

There have been increasing data documenting multiple micronutrient deficiencies in HIV/AIDS in the absence of proper and adequate supplementation. In addition, there have been increasing recommendations for supplementation in this group of people. In pursuance of

this goal, members of the Physicians Association for AIDS Care have repeatedly emphasized the importance of supplementation. They highlighted their concern and objectives with emphasis during the third international symposium on nutrition and HIV/AIDS where they reiterated the importance of supplementation for people living with HIV/AIDS. Research has indicated that HIV-related dementia may be prevented or controlled with good nutrition. Observations from published research studies suggest that many of the negative effects of protein calorie malnutrition (PCM) may be directly or indirectly related to deficiency of trace elements. Baum et al.<sup>5</sup>, recommended supplementation with vitamins A, C, E, the B vitamins, and the minerals such as zinc, magnesium and selenium. It was also about this time that further research documenting the benefits of supplementation became available.

Abrams et al.<sup>6</sup> published the results from two-six year epidemiological studies, one of which was a study of 296 men; a prospective study of dietary intake and AIDS in homosexual men. The authors observed that higher intake of all eleven micronutrients investigated was associated with higher CD4 count; daily use of multivitamin was associated with a reduced risk of AIDS and a significantly reduced risk for low CD4 count. In addition, there is increasing evidence that micronutrient supplementation is associated with absence of, or reduced deficiencies and promotes clinical stability.

The supplement N-acetyl cysteine (NAC) has been noted to be of importance as well. It is a safe means to supplement the amino acid cysteine which become deficient in HIV/AIDS<sup>7</sup>. A group of scientists have stated that AIDS may be the consequence of a virus-induced cysteine deficiency<sup>8</sup>. Cysteine is also a known source of wasting and associated with glutathione.

## CONCLUSION

Nutrition intervention to prevent or reverse weight loss and wasting with HIV infection may help to preserve independence, to improve quality of life and to prolong survival. Micronutrient intervention may help to strengthen the immune system and reduce the severity and impact of opportunistic infections in people living with HIV/AIDS. Some nutritional imbalances may directly affect HIV viral replication. Correcting these imbalances may also help to slow HIV disease progression and prolong survival. More research is still very much needed to determine the dosage of various micronutrients for use by HIV/AIDS patients. Moreover defined roles of nutritional supplementation in immune response and in the management of HIV/AIDS patients needs to be examined.

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