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***Corresponding author**

Dereje Gedle, Department of Public Health, College of Medicine and Health Sciences, Debre Markos University, Ethiopia, Tel: + 251913190403; Email: drakselina@yahoo.com

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Letter to the Editor**Effects of HIV/AIDS on Micronutrients****Dereje Gedle****Department of Public Health, College of Medicine and Health Sciences, Debre Markos University, Ethiopia***Letter to the Editor**

Both HIV/AIDS and malnutrition are common problems in Sub-Saharan Africa particularly in Ethiopia. HIV/AIDS and malnutrition effects are interconnected and worsen one another in a vicious cycle. However, there is limited studies regarding on effects of HIV/AIDS on malnutrition particularly micronutrients.

Effects of HIV/AIDS on micronutrients

Deficiencies of micronutrients are common problem in People Living with HIV/AIDS (PLWHA) including vitamins A, B-complex, C, and E and selenium and zinc, which are needed by the immune system to fight infections [1]. In the United States, PLWHA especially adolescents and young adults living with HIV/AIDS were recently reported to have inadequate intake of micronutrients [2]. A study conducted at Gondar, Ethiopia, Selenium deficiency (62%), zinc deficiency (47%) and magnesium deficiency (2%) were observed among school children [3]. On the other hand, a study conducted at Addis Ababa, Ethiopia, out of 153 HIV-positive adult individuals demonstrated low serum zinc levels ($< 10.7 \mu\text{mol/L}$) in 53% of participants, low serum retinol levels ($< 30 \mu\text{g/dL}$) in 47% of participants and Low hemoglobin levels ($< 12 \text{g/dL}$) were observed in only 4.72% subjects [4]. Vitamins and minerals are essential in the HIV-nutrition relationship due to their critical roles in cellular differentiation, immune system reactions, enzymatic processes, and other body functions. Lack of anti-oxidant micronutrients may contribute to oxidative stress, and accelerate immune cell death and increase the rate of HIV replication [5].

Immunology of HIV infection and micronutrients

HIV infection causes a direct or immunological virotoxic effects on gastrointestinal tract which shows blunted villi, damaged epithelial barrier with increased permeability and malabsorption of bile acid and vitamin B12, enterocyte apoptosis and microbial translocation. There is also reduced luminal defending and immense CD4 T-cell reduction but high concentration of infected CD4 T cells [6]. ART marked depletion of T-cell activation and apoptosis and helps to decrease naive T-cell consumption and restore their numbers [7].

Vitamin A has a significant role in nucleic acid synthesis. Its deficiency is characterized by lymphoid tissue atrophy, impaired IgG responses to protein antigens, depressed cellular immunity and pathologic alterations of mucosal surfaces. In deficiency of vitamin C, may impaired chemotaxis, therefore microorganisms cannot be engulfed and destroyed [8]. Vitamin D acts as an immunoregulatory and a lymphocyte differentiation hormone [9]. Zinc is the major antioxidant element in many immune responses, but within the context of HIV doubts remain concerning its role [10]. However, most studies have identified decreased plasma zinc concentrations in HIV positive individuals from different parts of the world [11]. Selenium has an important role immune system, which serves as an antioxidant and contributes to cytotoxicity of natural killer cells and antibody responses [12]. Iron deficiency results in impaired phagocytic killing, less response to lymphocyte stimulation, fewer natural killer cells, and reduced interferon production [13].

Therefore, targeted food and nutritional assistance to PLWHA and their families has the potential to improve nutrition and may reduce susceptibility to HIV infection. The negative interconnected effects of HIV infection and malnutrition demand special focused efforts to ensure that effective solutions are devised and implemented. There is a need to integrate nutritional care along with ART treatment in comprehensive continuum of HIV care in PLWHA.

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