

AIDS and the Role of Nutrients

K. Vijayanthiwala¹.

A few years ago, we learned of a dreadful new and mysterious disease that was spreading very rapidly and some projected that it would be killing millions of people within a few years and bankrupting our healthcare system in the near future. However, this hasn't happened due to the discovery of the cause of the disease and its transmission by Dr. Luc Montagnier and his coworkers of the Pasteur Institute in Paris, now we call this as Acquired Immune Deficiency Syndrome (AIDS) and these patients have a depletion of certain white blood cells called CD4+ T-helper lymphocytes and is related to AIDS. Later the discovery of both HIV-1 and HIV-2 strains of virus which is the cause of AIDS has led to preventive measures that can protect those at high risk.

For many years now, some scientists see a connection between HIV and the development of AIDS. Others doubt this connection and attribute the symptoms of AIDS to malnutrition and consequence of poverty in the developing world. Whatever the causes of AIDS, certain combinations of vitamins and other micronutrients offer the only real solution to this dreadful disease. The doctors are prescribing drugs and these drugs are highly toxic and destroy the immune system and thereby further aggravate already existing immune deficiencies. These drugs are literally paralyzing the immune system increasing the risk of succumbing to tuberculosis (T.B) and other infectious diseases. This is the high time to identify the basis for a national health care strategy that allows the effective, safe, affordable and sustainable control of the AIDS epidemic. All the experts present in the conference titled "natural control of AIDS- from science to health care policies", held in Johannesburg on December 4, 2005 come to a conclusion that micronutrients and healthy nutrition are the key to fight against AIDS and other immune deficiencies.

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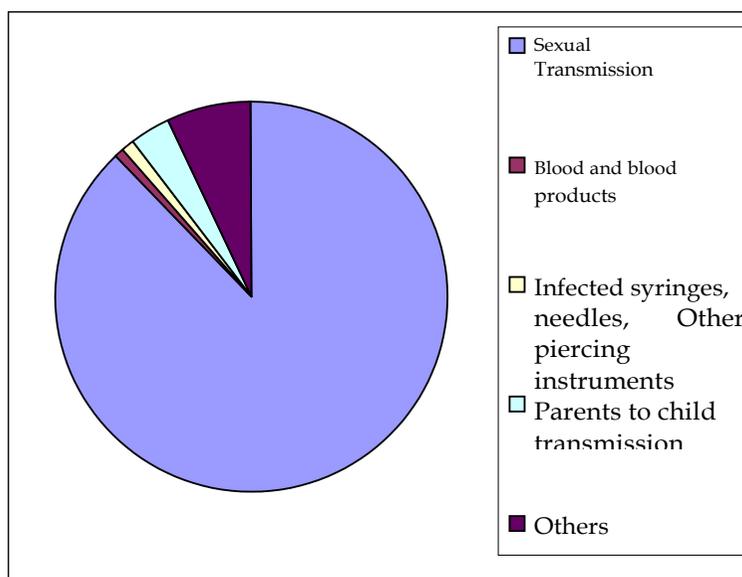
Studies point to low energy intake combined with increased energy demands due to HIV infection and related infections as the major driving forces behind HIV-related weight loss and wasting (WHO, 2003). Current evidence suggests that as the HIV infection progresses, the nutrient requirements change. The requirements are different for the two distinct phases of HIV infection, which are characterized by the absence or presence of illness symptoms: asymptomatic and symptomatic (USAID, 2007). WHO classifies HIV infection

1. Mahatma Gandhi National Institute of Research and Social Action, Mumbai

into four clinical stages: clinical stage I: asymptomatic, normal activity; clinical stage II: symptomatic, ambulatory, unintentional weight loss <10%; clinical stage III: symptomatic, in bed <50%, unintentional weight loss >10%, clinical stage IV: symptomatic, in bed >50%, HIV wasting syndrome. Asymptomatic phase refers to clinical stage I and symptomatic phase refers to clinical stages II-IV.

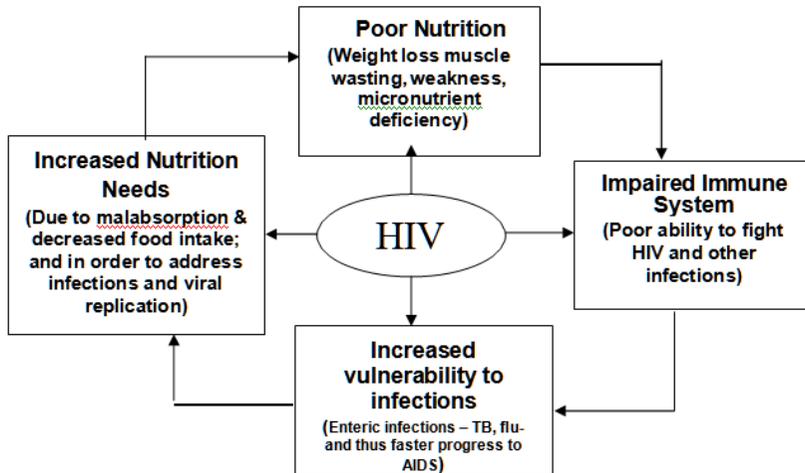
Modes of transmission in A.P

1.	Sexual Transmission	87.64
2.	Blood and blood products	1.06
3.	Infected syringes, needles, Other piercing instruments	0.98
4.	Parents to child transmission	3.47
5.	Others	6.84



Nutrition and food security play a critical role for combating HIV/AIDS. Eating healthy foods and maintaining proper weight strengthen the immune system, making it better able to slow the progression of HIV to AIDS and fight opportunistic diseases. Good nutrition also helps body to tolerate medical treatments more easily and improves sense of well being, which in turn strengthens immune system. HIV positive children are comparatively more prone to infection and their nutritional needs thus are greater than children of their age who are HIV negative. The good nutrition is important for growth, development, replacement and repair of cells and tissues, production of energy, warmth, movement and work, to carry out chemical process and protection against diseases and recovery from the disease. We need food in the right amounts and combinations of both macro and micro nutrients to function our body properly and also food need to be free from microorganisms and other toxic substances.

The relationship between poor nutrition and HIV/AIDS is a vicious circle.

FIGURE1: The cycle of malnutrition and infection in the context of HIV/AIDS

The combination of the following factors leads to poor nutrition with HIV/.AIDS

1. Body immune response to the virus used up more energy and nutrients than normal. When opportunistic infections are present our body needs more extra nutrients
2. HIV/AIDS people often need to make up for protein losses which may result from malabsorption due to diarrhea. Protein loss leads to muscle tissue breakdown.
3. Concern about your health can lead to high stress levels, which affects the immune system negatively.
4. Repeated infections and fever often results in poor appetite .Medical treatments sometimes suppress appetite, as do psychological factors such as depression and anxiety
5. Physical symptoms, such as mouth and throat soreness can interfere with eating
6. Fatigue can make eating difficult, specifically in later stages
7. HIV and the other infections can damage the lining of the gut, this interferes with digestion and absorption. Malabsorption results in diarrhea, which in turn causes nutrient and water loss.

Therefore, good nutrition is important as it increases resistance to infection and other opportunistic diseases. Good nutrition makes a person stronger, more energetic and productive. The aims of good nutrition are to maintain ideal body weight, minimize body loss and overcome problems that interfere with nutrient intake and absorption. During the asymptomatic phase, energy requirements increase by 10%.

Table 1: cd4>15% or asymptomatic (10% additional calories)

Type of work	Sex	ICMR calorie requirement Per day	Additional calories (10%)
Sedentary	Male Female	2425	+242.25
		1875	+185.25
Moderate	Male Female	2875	+287.25
		2225	+222.25
Heavy	Male Female	3800	+380.00
		2925	+292.25

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Table2:CD4 <15% or symptomatic (20% Additional Calories)

Type of work	Sex	ICMR calorie requirement Per day	Additional calories (20%)
Sedentary	Male Female	2425	+485
		1875	+375
Moderate	Male Female	2875	+575
		2225	+445
Heavy	Male Female	3800	+760
		2925	+585

Table 3 :CD4 <15% or symptomatic and 10% weight loss (30% Additional Calories)

Type of work	Sex	ICMR calorie requirement Per day	Additional calories (30%)
Sedentary	Male	2425	+725.5
	Female	1875	+562.5
Moderate	Male	2875	+862.5
	Female	2225	+667.5
Heavy	Male	3800	+1140
	Female	2925	+877.5

Table4: symptomatic and in bed (50% Additional Calories)

Type of work	Sex	ICMR calorie requirement Per day	Additional calories (50%)
Sedentary	Male	2425	+1212.5
	Female	1875	+937.5
Moderate	Male	2875	+1437.5
	Female	2225	+1112.5
Heavy	Male	3800	+1900
	Female	2925	+1462.5

During pregnancy and lactation, the same recommendations are required to follow in addition to the extra energy, protein and micronutrients.

In case of children, during the asymptomatic phase, energy requirements increase by 10%, Symptomatic phase 20%, Symptomatic phase and 10% weight loss 30% and with growth failure 50% (Table 5,6,7,8).

Table 5: Macronutrient supplement guidelines for HIV infected children CD4>15% or asymptomatic (10% Additional calories)

Age Years	ICMR Calorie requirement Per day	Additional calories (10%)
1-3	1240	124
4-6	1690	169
7-9	1950	195

Table 6: CD4<15% or symptomatic (20% Additional calories)

Age Years	ICMR Calorie requirement Per day	Additional calories (20%)
1-3	1240	248
4-6	1690	338
7-9	1950	390

Table 7: CD4<15% or symptomatic and 10% weight loss (30% Additional calories)

Age Years	ICMR Calorie requirement Per day	Additional calories (30%)
1-3	1240	372
4-6	1690	507
7-9	1950	585

Table 8: HIV infected children with growth failure

Age Years	ICMR Calorie requirement Per day	Additional calories (50%)
1-3	1240	620
4-6	1690	845
7-9	1950	975

(Source: ICMR)

Role of Micronutrients

Researchers began to examine the associations between micronutrient abnormalities and HIV disease progression.

- Decreasing Vitamin E levels over time were associated with significant decline in CD4+ cell counts and increased progression to AIDS.
- Low Vitamin B12 levels were found to be associated with more rapid disease progression.
- Low serum selenium levels increased the risk of HIV – related mortality by more than ten fold in onestudy.
- Low Vitamin A levels were associated with increased risk of mortality in HIV infected injection drugusers.

How Micronutrient Fight AIDS

- Limiting the spread of infections in the body (Example: Lysine, Vitamin C)
- Decreasing multiplication of viruses (including HIV) in the body (Example: Vitamin C)
- Preventing the activation of silent viral infections (Example: Vitamin C)
- General improvement of the immune system function (Example: Zinc, Selenium)

There are 11 micronutrients (Vitamin A, Carotene, Retinol, Vitamin C, Vitamin E, Folic Acid, Riboflavin, Thiamine, Niacin, Iron and Zinc) and Iron, Vitamin E and Riboflavin are statistically significant, and approached significance for Vitamin C, Thiamine and Niacin.

Higher intake of all 11 micronutrient was associated with higher CD 4 counts at baseline and was significantly so for six of them.

The possibility that higher nutrient intakes may delay the development of AIDS cannot be ruled out. In India hardly there are any studies on nutrition in relation to HIV, the NIN propose to take up studies on the assessment of micro nutrient status and some pro inflammatory markers in HIV population. They have one ongoing project (entitled IB BA – sponsored by Bill and Melinda Gates Foundation) on the prevalence of HIV in India.

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The increased risk of malnutrition in HIV/AIDS persons may be minimized by the following:

1. Pay attention
2. Discuss the diet and related problems with a doctor or nutritionist
3. Eat a balanced diet
4. Exercise to build muscle
5. Drink at least eight glasses of fluid in the form of water or other beverages
6. Avoid alcoholand

7. Get the essential vitamins and minerals.

If possible, these people should meet their additional energy needs by increasing consumption of foods with high nutrient densities instead of increasing consumption of high-energy foods that are low in protein and micronutrients. The above recommendations are for all people living with HIV/AIDS, irrespective of whether they are taking antiretroviral (ARV) drugs or not.

References

1. Montagnais, I and Pass water, Richard A: Antioxidant Nutrients and AIDS: Exploring the possibilities, Interview-Paris,1995.
2. Patrick, I: Nutrients and HIV: Part ii-Vitamins A and E, Zinc, B-vitamins and magnesium. *Altern Med Rev*,Feb;5(1):39-51
3. 3Semba,RD and Tang, AM: Micronutrients and Pathogenesis of human immunodeficiency virus infection,(*Br J Nutr*) *Med Result*, March;81(3)
4. Tang, AM and Smith, E: Selected vitamins in HIV infection, A review (*AIDS patient care STDS*) Apr; 12(4):263-73, 1998.
5. USAID: Recommendation for the nutrient requirement for people living with HIV/AIDS: 2007.
6. WHO: Nutrient requirements for people living with HIV/AIDS: Report of a technical consultation. Geneva, 2003.