

The Nutrition Side of Food Insecurity

Transcript of comments made by Cade Fields-Gardner, MS, RD, LD, CD, HIV-specialist and Nutrition Consultant to the World Initiative for Soy in Human Health (WISHH) during the April 16, 2003 event:

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When asked what is important to their health and survival, a patient survey suggested that the primary change a person in a developed country will make when they learn of their HIV status is to improve their diet. In developing countries where HIV may heavily impact the population, even that basic option is not always available.

Hunger affects more than 800 million people in the world today and malnutrition kills 24,000 people daily, more than even the very scary statistics of HIV prevalence and related deaths.¹ It is estimated that 42 million people are currently HIV infected, most of whom live in sub-Saharan Africa. Approximately 8,500 deaths occur daily as a result of HIV-infection complications.² It is estimated that 14 million children have been made orphans by HIV infection and AIDS. The difference between life with HIV and death from HIV-related complications includes many psychosocial, economic, and political issues that affect the existence of and access to basic life needs and specific HIV-related medical care. In starting work in the field of HIV in the mid-1980s I heard that nutrition didn't matter, that wasting and dying were inevitable parts of the natural history of HIV infection. In 1989 a landmark study proclaimed two important findings:

1. Malnutrition is not a necessary component of HIV infection
2. The timing of death for someone who is HIV infected is related specifically to the degree of malnutrition and not specifically to the presence of an opportunistic infection.

This led to further research about the nutritional needs of people with HIV infection and the nutritional properties of foods that impact health.

We have talked about the overriding importance of a safe water supply and adequate calories to sustain energy levels. We have concentrated on the use of food to mitigate the impact of poverty, drought, famine, and the economic and political backdrop that leads to the rampant spread of HIV infection. We have talked about the death rates and drop in productivity of an entire generation and their following generation because of HIV infection. What we need to do now is to talk about the effective use of food beyond the roads, trucks, and delivery signatures. We need to get to the “cell” of the matter. We need to show the ability to multitask in formulating and implementing multilateral solutions and to make each contact and intervention count for as much as it can.

In the 1989 study³ that showed a solid-line between the severity of malnutrition and death, the conclusions were even more specific. The strongest predictor of death was not the loss of weight, but the loss of very specific protein stores found in muscle and organ tissues of the body that use up most of the calories you consume and are responsible for the important life-sustaining body functions. The authors found the same thing that was found in medical research conducted during the massive starvation that occurred at the

Russian Front in World War II and during the fasting protests in Ireland, there is a point of loss of this type of tissue beyond which you cannot survive.

In sub-Saharan Africa tuberculosis is one of the most common opportunistic infections in HIV-infected adults and the leading infectious disease cause of death in the world.⁴ A study conducted in Uganda⁵ took a careful look at the relative risk of HIV infection on the development of symptomatic tuberculosis. They concluded that not only does the combination of HIV infection with malnutrition present a strong risk factor, but also that specifically a lower level of body protein stores, may be a greater risk factor for the development of pulmonary tuberculosis than HIV infection alone.

At what level, then, shall we expect morbidity and mortality to occur? Research has suggested interim landmarks for loss of function associated with these important tissues. At 5% loss from ideal there is an increased risk for morbidity and mortality in HIV infection.⁶ At this level the body reduces its overall function, the person will complain of fatigue (if they can complain), and their body is more susceptible to the ravages of opportunistic and other infections that lead to more body protein losses. At 10% loss, a person starts on the road of disability. At 15-20% loss, a person may no longer be able to walk, stand, sit, and finally loses the ability to clear their throat and swallow.

Researchers knew that the medical picture was complex, but sought out those items most related to this downward decline. Here is what they found: the initiating factor for malnutrition and the decline in function and loss of life that followed was mostly related

to starvation. While that sounds simple, remember what that means. There was the possibility that by blocking malnutrition we could reduce and eliminate many of the complications seen in HIV and other infection and support survival and function. But, before that could be said, it had to be tested.

One such study described the effect of nutrition support on HIV-infected children. Children who are HIV-infected typically show a pattern of growth and developmental failure and long-term malnutrition because of complications. Even with medication treatments with anti-HIV drugs, we continued to see stunting, lower than optimal weights, and developmental disabilities as well as a higher death rate. In the United States studies of children were completed showing that nutritionally supplemented patients did not experience growth failure, including stunting, and were able to follow normal growth and development curves.

We know that treatment for HIV infection is essential to long-term survival. However, a longitudinal cohort study that continues to gather data for more than six years since the full introduction of anti-HIV medication therapies in developed countries suggested that medications aren't enough to fully answer the problem of wasting. Even with the use of anti-HIV drugs and close monitoring for their effectiveness in lowering HIV viral load and improving immune function, the prevalence of wasting is currently at nearly 40%!

A longitudinal intervention study using nutritional supplementation in 467 adults yielded two telling reports. First that the addition of calories and micronutrients (vitamins and

minerals), while contributing to weight maintenance did not significantly contribute to the maintenance of those important functioning protein stores in the muscle and organ compartments that sustain life. The second report noted that it was the dose of protein intake was specifically related to the level of maintenance and improvement of protein stores. Even more interesting, an evaluation of the types of protein provided showed that a high-quality plant-based protein was equivalent in effectiveness to animal-based proteins in accomplishing this important goal.

Supporting the body's ability to maintain function means supporting body cell mass. Support for body cell mass in the case of HIV infection requires protein doses at up to twice the level needed by people who are not infected. In the United States we recommend a high protein diet to our patients. Fortunately, that *is* the average American diet and requires little change (other than to improve the levels and qualities of associated dietary carbohydrates and fats). In regions where basic protein needs are a challenge, protein fortification may be an appropriate response.

Food is the most basic of all human needs. Using food to improve survival and function of the generations at risk means moving beyond transport and delivery and into the nutritional purpose of our work. We need to educate those who remain unclear about the relationship between nutrition and HIV infection, nutrition and debilitation, and nutrition and survival that there is well-researched evidence and connections that we currently integrate into our medical care in this and other developed nations.

While the social, economic, and political factors can influence the exposure to HIV infection, it is malnutrition that is clearly associated with transmission and seroconversion. We need to show those who proclaim that medications are the primary avenue to stop the debilitation associated with HIV that this cannot happen in a person who cannot maintain their nutritional well being. While HIV infection can increase the risk for complicating infections, including tuberculosis and malaria, it is likely that malnutrition, specifically in the body's protein stores, is a more significant factor.

Medication therapies require strict dosing and adherence for a lifetime and have interactions with food and the body's nutrition. We monitor anti-HIV strategies for three types of successes: immune function improvement, HIV viral load reduction, and clinical well-being. The third one is most highly related to survival and most highly impacted by nutritional well-being.

Thus, primary therapy will be an exercise in multitasking and will include a strong nutrition support or we risk failure and possible disaster with the introduction of anti-HIV medications in severely compromised people. For medical treatment to succeed, support for nutritional improvement is essential. We know that calories are important to overall weight maintenance and that the addition dietary carbohydrate, fat, and micronutrients in the absence of a high protein diet in HIV disease do not readily translate into the maintenance and improvement of essential protein stores. And we know that the body's protein stores are the most important targets for medical success. And we know that protein dose is closely related to the level of the body's protein stores, that the level of

protein stores is related to physical and metabolic function (including the ability to process and use medications), and that the level of protein stores is supported primarily by protein intake and secondarily by muscle building activity, and that the level of protein stores is clearly and unequivocally related to survival. And, finally, we know that high-quality plant-based protein sources are as effective as more cost-prohibitive animal sources.

The interesting part of this is that beyond the rethinking process it probably doesn't take more money, should not take more time, may even cut the risk and cost of failure quite significantly. It does not preclude the introduction of medications, but is essential to that task. It just takes the foresight of educated decision-makers in all of the arenas involved, including governmental, non-governmental, and business concerns, and the willingness to act.

¹ World Food Program statistics available at www.wfp.org/index.asp?section=1

² Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO). AIDS Epidemic Update, December 2002. available at http://www.unaids.org/worldaidsday/2002/press/update/epiupdate2002_en.doc

³ Kotler DP, Tierney AR, Wang J, Pierson RN. Magnitude of body-cell-mass depletion and the timing of death from wasting in AIDS. *Am J Clin Nutr.* 1989;50:444-447.

⁴ Whalen CS, Semba RD. Tuberculosis. In: *Nutrition and Health in Developing Countries* (RD Semba and MW Bloem, eds), pp 209-235. Totowa, NJ, Humana Press. 2001.

⁵ Shah S, Whalen C, Kotler DP, Mayanja H, Namale A, Melikian G, Mugerwa R, Semba RD. Severity of human immunodeficiency virus infection is associated with decreased phase angle, fat mass and body cell mass in adults with pulmonary tuberculosis infection in Uganda. *J Nutr* 2001;131:2843-2847.

⁶ Polsky B, Kotler D, Steinhart C. HIV-associated wasting in the HAART era: guidelines for assessment, diagnosis, and treatment. *AIDS Patient Care and STDs.* 2001;15:411-423.