TLALELETSO

HIV & Nutrition

HIV and nutrition are intimately linked. HIV infection can lead to malnutrition, while poor diet can in turn speed the infection's progress.

INTRODUCTION

As HIV treatment becomes increasingly available in the poorest parts of the world, critical questions are emerging about how well the drugs work in people if they are short of food. This issue of Tlaleletso looks at what is known about the relationships between HIV and nutrition.

HIV is well known for causing severe weight loss known as wasting. In East Africa, the illness was at first called "slim" because sufferers became like skeletons. Yet body changes are not only seen during AIDS; less dramatic changes often occur in earlier stages of HIV infection. Whereas starving people tend to lose fat first, the weight lost during HIV infection tends to be in the form of lean tissue, such as muscle. This means there may be changes in the makeup of the body even if the overall weight stays the same.In children, HIV is frequently linked to growth failure. One large European study found that children with HIV were on average around 7 kg (15 lbs) lighter and 7.5 cm (3 inches) shorter than uninfected children at ten years old. [1]

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Notes from the Editor….

Tlaleletso is a monthly publication produced by the Botswana UPenn Partnership, in response to your expressed need for accessible, digestible clinical information.

This issue of Tlaleletso looks at what is known about the relationships between HIV and nutrition.

BOTSWANA-UPENN PARTNERSHIP

DID YOU KNOW?

They called it the "slim disease." Its victims became ill, lost weight and died. No one knew why. The year was 1982. This was the first presentation of HIV in Africa

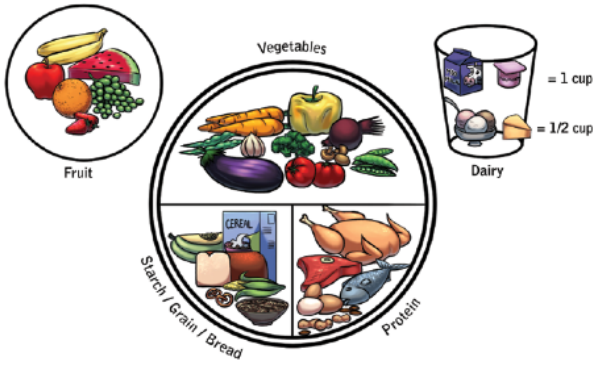
WHAT CAUSES THESE CHANGES?

One factor behind HIV-related weight loss is increased energy expenditure. Many studies have demonstrated that people with HIV tend to burn around 10% more calories while resting, compared to those who are uninfected. People with advanced infection or AIDS (particularly children) may expend far more energy.[2]

There are two other reasons why HIV infected adults are more likely to lose weight:

The first factor is decreased energy intake or, to put it simply, eating less food. Once HIV has weakened the immune system, various infections can take hold, some of which can affect appetite and ability to eat. For example, sores in the mouth or throat may cause pain when swallowing, while diarrhoea or nausea may disturb normal eating patterns. Someone who is ill may be less able to earn money, shop for food or prepare meals. Stress and psychological issues may also contribute.

Secondly, weight loss or growth failure can occur when the body is less able to absorb nutrients – particularly fat – from food, because HIV or another infection (such as cryptosporidium) has damaged the lining of the gut. Diarrhoea is a common symptom of such malabsorption.



Medical Nutritional Therapy

- A patient centered-approach
- Assessing the patient's nutritional status and diabetes self-management knowledge and skills
- Identifying and negotiating nutritional goals
- Consistent carbohydrate intake and regular distribution of meals may help to control weight and control blood sugar levels

MICRONUTRIENT DEFICIENCIES

Micronutrients are vitamins and minerals that the body needs to maintain good health. Researchers have found that people with HIV are more likely to show signs of micronutrient deficiencies, compared to uninfected people. Specifically they have found low levels of vitamin A, vitamin B12, vitamin C, vitamin D, carotenoids, selenium, zinc and iron in the blood of various populations.

Nevertheless, it must be noted that the evidence is not entirely conclusive. It is possible that HIV might affect the markers used to measure micronutrient levels more than it affects the actual amounts of micronutrients available in the body.[4] Some studies suggest that antiretroviral treatment improves micronutrient status.[5]

ANTIRETROVIRAL THERAPY

Current antiretroviral treatments treat HIV infection and prevent severe wasting, as well as other AIDS-related conditions. Emaciated people tend to regain weight once they begin treatment, and stunted children start to grow faster. Nevertheless, the drugs do not eliminate wasting.

Studies have found that relatively small weight loss (between 5% and 10% over six months) is quite common among people with HIV who are taking treatment and not trying to lose weight.[3] Although this might not seem like much, losses of this size have been linked to an increased risk of illness or death.

In addition, some antiretroviral drugs have been linked to lipodystrophy. Lipodystrophy is a syndrome of conditions associated with changes in fat distribution. Prolonged treatment with certain drugs, notably NRTIs such as stavudine and zidovudine is with losing fat from the face, limbs or buttocks, or gaining fat deep within the abdomen, between the shoulder blades, or on the breasts. This is referred to as lipoatrophy.

Antiretroviral treatment can also contribute to lipid abnormalities by raising LDL cholesterol, lowering HDL cholesterol, and raising triglyceride levels in the blood. This may result in higher risks of heart disease, stroke and diabetes. This has been discussed in Issue 14 of Tlaleletso.

DID YOU KNOW?

Vitamin A plays a number important functions in the body. It is not only important in immune function, but plays a role in vision, gene transcription and bone metabolism. Approximately 250,000–500,000 children in developing countries become blind each year owing to vitamin A deficiency, with the highest prevalence in Southeast Asia and Africa.

HIV DISEASE PROGRESSION

The links between HIV and nutritional status run both ways. It has long been known that weight loss strongly predicts illness or death among people with HIV. More recently it has been found that this applies even to people taking antiretroviral treatment.

Losing as little as 3-5% of body weight significantly increases the risk of death; losing more than 10% is associated with a four- to six-fold greater risk.[6] A Zambian study involving nearly 30,000 patients has shown that failure to gain weight six months after the start of antiretroviral treatment increases the chance of death ten fold when compared with those who gain over 10 kilograms.[7]

Various micronutrients have been linked to changes in the rate at which HIV infection progresses to AIDS. Low levels of vitamin A, vitamin B12, vitamin E and selenium seem to accelerate progression. The effects of other micronutrients, however, are more controversial. One such example is zinc. Although zinc is essential for a healthy immune system, it has been shown to play a role in HIV's replication cycle.[8]

There is strong evidence that malnourished people are less likely to benefit from antiretroviral treatment. One study in Malawi found that patients with mild malnutrition (a low body weight for their height) were twice as likely to die in the first three months of treatment. For those with severe malnutrition the risk was six times greater than for those of healthy body weight.[9] A study in Zambia showed death rates in the first three months of starting antiretroviral treatment were highest (95%) among the most severely malnourished.[10]

DISEASE PROGRESSION (cont.d)

Clinicians also need to be aware that certain antiretrovirals may increase the risk of micronutrient deficiency. Certain drugs are associated with nausea, vomiting, and diarrhea, eg, Aluvia. If such drugs lead to reduce food intake or reduced food absorption then they can also lead to a worsening of nutritional deficiencies.

HIV TRANSMISSION

There are a number of theories related to how nutritional deficiencies might increase HIV transmission. Some have argued that micronutrient deficiencies may increase viral load by enabling HIV to replicate faster, or by weakening the immune system. Research in this area has, however, been largely inconclusive. The strongest evidence links low levels of retinol (the animal form of vitamin A) in women's blood with increased rates of mother-to-child transmission. [11]

Poor nutrition may also affect the spread of HIV in a very different way: by altering sexual behavior. One study of two thousand people in Botswana and Swaziland found that women lacking enough food to eat were less likely to use condoms and more likely to engage in risky activities, such as exchanging sex for money or resources.[12]

MULTIVITAMINS

A trial involving a thousand HIV positive pregnant women in Tanzania found that daily multivitamins benefited both the mothers and their babies, compared to placebo. After four years, multivitamins were found to reduce the women's risk of AIDS and death by around 30%. A smaller trial in Zambia found no benefits from multivitamins after one month of use.[13]

Based on these and other, less rigorous studies, many experts recommend multivitamins for people living with HIV, particularly those who are undernourished and have advanced disease.

INDVIDIDUAL NUTRIENTS

When it comes to supplementing individual vitamins and minerals, the evidence is less clear. Few studies have found significant effects on HIV transmission, disease progression or death rates. The most interesting results have come from studies of vitamin A and zinc.

Vitamin A supplements have been found to reduce rates of illness and death among African children living with HIV. The World Health Organization recommends vitamin A supplements every 4-6 months for all young children (6-59 months old) at high risk of vitamin A deficiency; this includes those born to HIV positive mothers in resource-limited settings

In contrast, studies providing vitamin A to pregnant, HIV positive women have had mixed results. Two trials in South Africa and Malawi found no effect on preventing mother-to-child transmission (PMTCT) but saw some other benefits for the infants.

INDVIDIDUAL NUTRIENTS (cont.d)

A third trial in Tanzania found that vitamin A supplementation had no beneficial effects, and actually increased the risk of mother-to-child transmission by 40%.[14] The inconsistency of these results (perhaps due to differences in diet) means that vitamin A supplementation is not generally recommended for HIV positive, pregnant women.

Several studies have found that zinc supplementation reduces cases of diarrhea among children in developing countries. However most trials have been conducted among HIV negative children outside Africa, and their results may not apply in all situations. One study in South Africa found that zinc supplements reduced bouts of diarrhea among HIV positive children, without hastening the progress of their HIV infection.[15]

Botswana guidelines recommendations

Complete nutrition counseling and education for each patient

When appropriate and feasible, families should be encouraged to develop alternative food sources, ie, home gardening.

Refer families for food assistance in cases of potential food insecurity. This is particularly important for all HIV infected pregnant and lactating women.

ADVICE FOR PATIENTS – A PRACTICAL APPROACH

Dietary advice should be tailored to individual circumstances. However, in general the recommendations for people living with asymptomatic HIV infection are much the same as for everyone else: meaning a healthy, balanced diet. Only three differences are worth noting:

- Because people with untreated HIV tend to burn more energy, the total number of calories should be around 10% higher than the usual guideline amounts, and up to 30% higher during recovery from illness. The balance of fat, protein and carbohydrates should remain the same.
- Many experts recommend a daily multivitamin (usually without iron, except in menstruating women or people with iron deficiency).
- The World Health Organization recommends vitamin A supplements every 4-6 months for young children living with HIV in resource-poor settings.

HIV positive people suffering loss of appetite may need to make an extra effort to ensure they are eating enough. Helpful suggestions include eating several small meals per day, taking exercise to stimulate appetite, possibly mashing or liquidizing food to ease swallowing, and seeking advice from a health provider or dietician.

If other approaches have failed to reverse wasting then doctors may recommend a liquid food supplement, or resistance exercise to build muscle. Other possibilities include steroids and hormone treatments, though these can be expensive and have serious side effects.

DIETARY RECOMMENDATIONS

- Daily multiple vitamins in patients with poor food intake or wasting
- Use of good hygiene with food preparation
- High protein diets
- A minimum of five portions of vegetables and fruits every day
- Thorough cooking of meat and avoidance of raw/under-cooked meat, eggs
- Discourage the use of special 'immune boosters; and alternative medicines which are of unproven benefit and are often very expensive.

SUMMARY

Weight loss in adults and growth failure in children are common in HIV/AIDS infected children and adults.

Resting energy expenditure is increased by around 10% in asymptomatic HIV-infected adults and children.

There is no evidence for increased protein requirement over and above that required in a balanced diet to satisfy the total energy requirements.

All HIV-infected adults, particularly those that are under-nourished or have advanced disease, may be of benefit from multivitamin supplementation

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