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Reducing chronic diseases of lifestyle and managing HIV using an evidence-based approach — what every clinician should know

Diseases of poverty, trauma-related illness, HIV/AIDS and cardiovascular diseases form the main burden for the South African health services.

The fastest growing epidemics in the country are those of cardiovascular diseases (CVD) and HIV/AIDS. It is estimated that 7 million people smoke, 7 million have hypertension, 4 million have diabetes, 4 million have hyperlipidaemia and 4 million are HIV-positive. Global health authorities warn that ignoring the emerging burden of CVD will subvert efforts to address HIV/AIDS and other epidemics.

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Diet and nutrition are as important in the promotion and maintenance of good health throughout life, as they are in the prevention of chronic non-communicable disease.The outcomes of certain diseases, including HIV and tuberculosis, are worse when the host is malnourished, and micronutrients are known to be important determinants of infectious disease morbidity.

Evidence-based guidelines for reducing the risk of cardiovascular disease by dietary and other lifestyle practices, as well as dietary recommendations in the management of HIV/AIDS, are underpinned by three principles:

- All individuals can safely follow dietary and lifestyle practices as a foundation for achieving and maintaining cardiovascular and overall health.
- Healthy dietary practices are based on an overall pattern of food intake over an extended period of time and not on a single meal.
- The guidelines form a framework within which specific dietary recommendations can be made for individuals based on their current status, dietary

preferences and cultural background.

DIABETES

There are currently an estimated 150 million cases of type 2 diabetes worldwide and this figure is expected to double by 2025. This massive increase is largely due to a general increase in weight gain, overweight and obesity and physical inactivity, particularly in the industrialised world and in transitional societies. Diabetes is now being identified at younger ages, including adolescence and childhood, especially in high-risk populations. The escalating costs of type 2 diabetes make a strong case for prevention by dietary modification and increased physical activity.

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Evidence for a healthy lifestyle in the prevention and treatment of type 2 diabetes

The evidence for lifestyle factors increasing the risk of developing diabetes is shown in Table I. Both weight and inactivity are independent risk factors. Increases in weight can significantly increase the risk of developing diabetes. Abdominal obesity is particularly important, and waist circumference or waist/hip ratio are more powerful determinants of subsequent type 2 diabetes than body mass index (BMI). There is also convincing evidence of increased risk of infants subsequently developing diabetes when maternal diabetes or intrauterine growth retardation took place.

However, exercise is known to protect against the development of type 2 diabetes, even in people who are overweight.

The dietary picture is far from clear. Table I outlines the evidence to date. It appears that a diet high in saturated fats increases the risk of impaired glucose tolerance (IGT) and subsequent progression to diabetes.

Three cohort studies have shown that dietary fibre or non-starch polysaccharides (NSPs) are protective against the development of type 2 diabetes, particularly the soluble type (Table II). Other factors which have been shown to be protective, yet which require additional research, are:

- low total fat intake
- increased intake of omega-3 fatty acids
- foods with a low glycaemic index
- exclusive breast-feeding during infancy.

Disease-specific recommendations

Overweight and obesity

Prevention and treatment of overweight should be a priority, particularly in high-risk patients. People should aim for a BMI towards the lower end of the normal range (BMI: 21 - 23). Referral to a dietitian is advised as skilled counselling is needed.

Diet therapy

Patients should be encouraged to decrease their total consumption of fat, and particularly of saturated fat (Table III). Recently there have been numerous studies showing

Table I. Summary of available level of evidence on lifestyle factors and risk of developing type 2 diabetes[1]

Type of evidence	Increased risk of type 2 diabetes	Decreased risk of type 2 diabetes
Convincing and accepted by the majority of medical scientists	**Overweight** **Obesity** **Abdominal obesity** **Inactivity** **Maternal diabetes (including gestational diabetes)**	**Voluntary weight loss in overweight and obese patients**
Probable but still investigating	**Saturated fat** **Intrauterine growth retardation**	**Dietary fibre (non-starch polysaccharides (NSPs))**
Insufficient but likely	**Total fat intake** **Trans fatty acids**	**N-3 fatty acids** **Low glycaemic index foods** **Exclusive breast-feeding**

Table II. Sources of fibre in the diet

Type of fibre	Good sources of fibre
Soluble fibre	**Oats, legumes (dry beans, dry peas), apples, pears, peas and other fruits and vegetables**
Insoluble fibre	**Bran, whole grains, wholewheat flour products, fruits and vegetables, edible seeds e.g. strawberries**

benefits from a high consumption of omega-3 (N-3) fats and a decrease in trans fatty acids. The intake of dietary fibre NSPs should be encouraged and is achieved through whole grains, legumes, vegetables and fruit (Table II).

CARDIOVASCULAR DISEASES

Cardiovascular diseases (CVD) are the main contributor to the global burden of disease among the non-communicable diseases.

Evidence for a healthy lifestyle in the prevention of CVD

The main factors which contribute to CVD risk are summarised in Table IV.

Disease-specific recommendations

Dietary fat

The quality of the composition of dietary fats in the diet strongly influences the risk of CVDs such as stroke and coronary heart disease (CHD) (Table IV). For optimal cardiovascular health, the diet should be low in saturated fatty acids (< 7% total energy intake). Additionally, foods high in myristic and palmitic acids should be reduced (Table III), and patients should be encouraged to read food labels to avoid these. A very low intake of trans fatty acids is recommended.

Polyunsaturated fatty acids such as linoleic acid should comprise 6 - 10% of the diet with an optimal ratio of N-6 to N-3 poly-unsaturated fatty acids at no more that 10 to 1. Monounsaturated fatty acids, such as oleic acid (found in canola and olive oil), should make up the rest of the daily fat. Total fat intake should not exceed 30% of energy intake.

Fruits and vegetables

Fruits and vegetables contribute to a reduced CVD risk through their potassium, dietary fibre (NSP) content and phytonutrients. About 500 g per day (5 - 6 servings) is recommended to reduce the risk of stroke, high blood pressure and cardiac arrhythmias. This will also meet the recommended potassium intake of 70 - 80 mmol/day.

Table III. Sources of fats and oils in the diet

Mono-unsaturated fatty acids	Saturated fatty acids	N-3 poly-unsaturated fatty acids	N-6 poly-unsaturated fatty acids	Palmitic acid	Myristic acid	Trans-fatty acids
				Restrict	Restrict	
(15 - 30% E*)	(< 7% E*)	(1 - 2% E*)	(5 - 8% E*)			(< 1% E*)
Olive oil	**Butterfat**	**Canola oil**	**Most vegetable oils**	**Palm oil**	**Butterfat**	**Margarine and shortening which is hydrogenated (hardened)**
Canola oil	**Coconut oil**	**Flaxseed oil**		**Animal fat**	**Coconut oil**	**Full-cream dairy products**
Nuts	**Palm oil**	**Soy oil**		**Confectionary**	**Confectionary**	**Meat fat/lard**
Avocado		**Fatty marine fish**		**Non-dairy creamers**	**Non-dairy creamers**	
Peanuts/oil	**Peanut oil**	**Walnuts**				**Deep fat fried foods**
	Animal fat	**Green leafy vegetables**				**Baked goods with margarine or shortening of the hard type**
		Soybeans				

*** Recommended proportion of total dietary energy intake.**

Table IV. Summary of available level of evidence of lifestyle factors and risk of developing cardiovascular diseases[1]

Type of evidence	Increased risk of CVD	Decreased risk of CVD
Convincing and accepted by the majority of medical scientists	**Myristic and palmitic acids** **Trans fatty acids** **High sodium intake** **Overweight/obesity** **High alcohol intake (for stroke)**	**Fruits and vegetables** **Fish and fish oils (EPA and DHA)** **Potassium** **Linoleic acid (LA)** **Regular physical activity** **Low - moderate alcohol intake**
Probable but still investigating	**Dietary cholesterol** **Unfiltered boiled coffee** **Beta-carotene supplements**	**Alpha-linoleic acid (ALA)** **Oleic acid** **Dietary fibre (NSPs)** **Whole-grain cereals** **Nuts** **Folate** **Plant sterols**
Insufficient but likely	**Fats rich in lauric acid** **Impaired fetal nutrition**	**Flavonoids** **Soy products**

Salt (sodium)

Sodium from all sources should be limited in order to reduce blood pressure levels. Current evidence recommends a sodium intake of less than 1.7 g/day. To meet this goal, daily salt should be restricted to less than 5 g (1 teaspoon) per day. All sources of sodium are included in this recommendation, including MSG and preservatives, frequently found in items such as stock cubes and 'flavoured' salts.

Alcohol

Although a low consumption of alcohol is protective against CHD, other health risks associated with alcohol consumption do not favour a general recommendation.

Physical activity

At least 30 minutes of moderate-intensity exercise, e.g. brisk walking on most days of the week, is considered sufficient, although lower limits are still ill-defined.

HIV/AIDS

HIV/AIDS is a major public health problem worldwide, but particularly in sub-Saharan Africa where it poses a major threat to household food security by means of diminished food production, as well as the inability to purchase food.

Evidence for the role of nutritional factors in the treatment of HIV/AIDS

Studies have shown that weight loss predicts morbidity and mortality in persons living with HIV/AIDS (PLWHA). Micronutrient deficiencies may also occur, the signs and symptoms of which are often lacking. Epidemiological evidence indicates that low dietary intakes of several vitamins and minerals may be associated with increased HIV disease progression and/or mortality.

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As a result, the role of micronutrients in HIV/AIDS takes on special importance in populations with marginal intakes. Few randomised clinical trials evaluating the efficacy of micronutrient interventions in PLWHA have been conducted. The current evidence on the role of micronutrients in host defence and HIV infection was recently summarised (Table V).

Limited evidence indicates that dietary counselling is an effective method to restore the energy and nutrient intake of PLWHA. In industrialised countries high-energy, high-protein nutritional supplements often form part of the nutritional management of PLWHA. However, few studies have evaluated the effects of supplemental nutrition. An increase in body weight has been documented in some intervention studies, but not in others. In many of these studies the increases in body weight comprised body fat and not lean body mass. Thus, many authors concluded that simply providing nutrients to a malnourished patient is inadequate and attention moved to the use of anabolic agents, such as recombinant growth hormone in the treatment of malnutrition.

Table V. Current evidence of the role of micronutrients in HIV infection[2]

	Immune functions	Replication	Viral load	Progression/ mortality	Transmission
Vitamin A	≠ ≠ ≠	.	~	Ø	(Ø)
B vitamins	≠ ≠	?	?	(Ø)	?
Vitamin C	≠	Ø	(Ø)	?	?
Vitamin E	≠ ≠	Ø	(Ø)	?	?
Iron	≠	≠	?	(≠)	?
Zinc	≠ ≠ ≠	.	?	(≠)	?
Selenium	≠	Ø	(~)	(≠)	?

≠, ≠≠, ≠ ≠ ≠ slight, moderate, considerable increase
Ø, ØØ, ØØØ: slight, moderate, considerable decrease
.: increase or decrease
~: no effect
?: not known
( ): only weak or observational data

Because of underlying factors contributing to poor baseline nutrition, nutritional care and support of PLWHA may be more important in developing countries. However, the extent to which nutritional therapy can reverse weight loss among PLWHA in Africa is largely unknown. The impact of nutritional interventions on body composition appears to be most effective during early rather than later stages of HIV infection. Early treatment for infections is probably one of the most effective ways of conserving the nutritional status of people living with HIV, as nutritional therapies fail without treatment of the underlying infection.

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Evidence suggests that aerobic exercise is safe for PLWHA who are medically stable. Regular aerobic exercise results in an increased CD4 count, improved cardiopulmonary fitness and psychological well-being. Further research is required to investigate the effects of aerobic exercise in people at varying stages of HIV disease, particularly those who are severely immunocompromised.

Disease-specific recommendations

Nutritional support for people with HIV should be provided in a holistic manner. The recommendations of a WHO expert consultation on the dietary and nutrient requirements for people living with HIV/AIDS are awaited.

Dietary counselling

Guides for nutrition counselling and support of HIV-affected households are available and provide practical recommendations to health workers on how to achieve healthy nutrition. Key messages include:

- start early
- choose your food according to your own tastes
- eat a variety of foods
- make starchy foods the basis of each meal
- eat lots of fruit and vegetables
- meat and dairy products may be eaten daily
- eat dried beans, peas, lentils, peanuts or soya regularly
- include sugars, fats and oils, especially after periods of weight loss
- use salt sparingly
- be as active as you can
- drink lots of clean, safe water.

Practical dietary advice for easing the symptoms of HIV/AIDS is also provided.

Micronutrient supplements

It is likely that daily micronutrient supplements will be required to reverse underlying deficiencies of HIV-infected populations, especially in developing countries. Few authors have attempted to formulate recommendations for the supplementation of micronutrients to HIV/AIDS patients. Some recommend the supplementation of vitamin A, along with antioxidants such as b-carotene, vitamin E, C and selenium. Others have concluded that the supplementation of twice the Recommended Daily Allowance (RDA) for most micronutrients is likely to be beneficial for the majority of HIV-infected individuals in Africa, since a range of micronutrient deficien-

cies usually co-exists. However, iron supplements should not be administered during opportunistic infections. For the management of HIV-infected children, the WHO guidelines for micronutrient supplementation in children with severe malnutrition may be used, comprising a standard multivitamin and mineral mixture. In addition, high-dose vitamin A supplementation should be provided.

Physical exercise

HIV-infected individuals who are medically stable may perform aerobic exercise for at least 20 minutes, three times a week.

References

1. World Health Organization. Diet, nutrition and the prevention of chronic disease: report of a joint WHO/FAO expert consultation. *WHO Technical Report Series* 2003; No. 916.
2. Friis H, Gomo E, Michaelsen KF. Micronutrient interventions and the HIV pandemic. In: Friis H, ed. *Micronutrients & HIV Infection.* London: CRC, 2002.

FURTHER READING

Department of Health. *South African National Guidelines on Nutrition for People Living with TB, HIV/AIDS and other Chronic Debilitating Diseases*. Pretoria, 2001.

Food and Agricultural Organization & World Health Organization. *Living well with HIV/AIDS. A Manual on Nutritional Care and Support for People Living with HIV/AIDS*. Geneva, 2003.

Nixon S, O'Brien K, Glazier RH, Wilkins AL. Aerobic exercise interventions for people with HIV/AIDS. *The Cochrane Library Issue 1*, 2002.

Piwoz EG, Preble EA. HIV/AIDS and Nutrition: A Review of the Literature and Recommendations for Nutritional Care and Support in Sub-Saharan Africa, 2000; SARA Project Bureau for Africa, Office for Sustainable Development, US Agency for International Development.

IN A NUTSHELL

Prevention/treatment of overweight should be a priority, particularly in high-risk patients, in order to reduce the risk of type 2 diabetes and CVD.

Patients should decrease their total consumption of fat, particularly saturated fat, trans fatty acids, as well as myristic and palmitic acids.

About 5 - 6 servings of fruit and vegetables per day are recommended to reduce CVD risk.

Regular fish consumption (1 - 2 servings per week) is protective against CHD.

Salt intake should be restricted to less than 1 teaspoon per day from all dietary sources.

At least 30 minutes of moderate-intensity exercise, e.g. brisk walking on most days of the week, is considered sufficient to reduce CVD risk.

Dietary counselling is an effective method to encourage PLWHA to restore their energy and nutrient intake, especially during early disease.

It is likely that PLWHA will require micronutrient supplementation to reverse underlying deficiencies.

Early treatment for infections is an effective way of conserving the nutritional status of PLWHA.

Aerobic exercise appears to be safe for PLWHA who are medically stable.

SINGLE SUTURE

Mortality associated with concomitant ibuprofen and aspirin in patients with cardiovascular disease

In January 2002 it was reported that scientists showed that ibuprofen blocks aspirin's inhibition of platelet aggregation. This has been supported by a UK-based study of more than 7 000 patients with coronary heart disease who were discharged from hospital on low-dose aspirin. It was found that compared with single-aspirin therapy (*i*) patients receiving the combination of aspirin and ibuprofen experienced almost double the risk of all-cause mortality, and an increased risk in cardiovascular mortality of approximately 75% was reported; and (*ii*) for persons prescribed aspirin in combination with other NSAIDs, e.g. diclofenac, there was no increased mortality risk. It is reported that although this evidence may be inconclusive, the authors of the study support the hypothesis that combination treatment for secondary prevention with ibuprofen and aspirin may be harmful owing to a possible antagonisation of aspirin's cardioprotective effects.

(*The Pharmaceutical Journal* 2003; **270:** 217.)