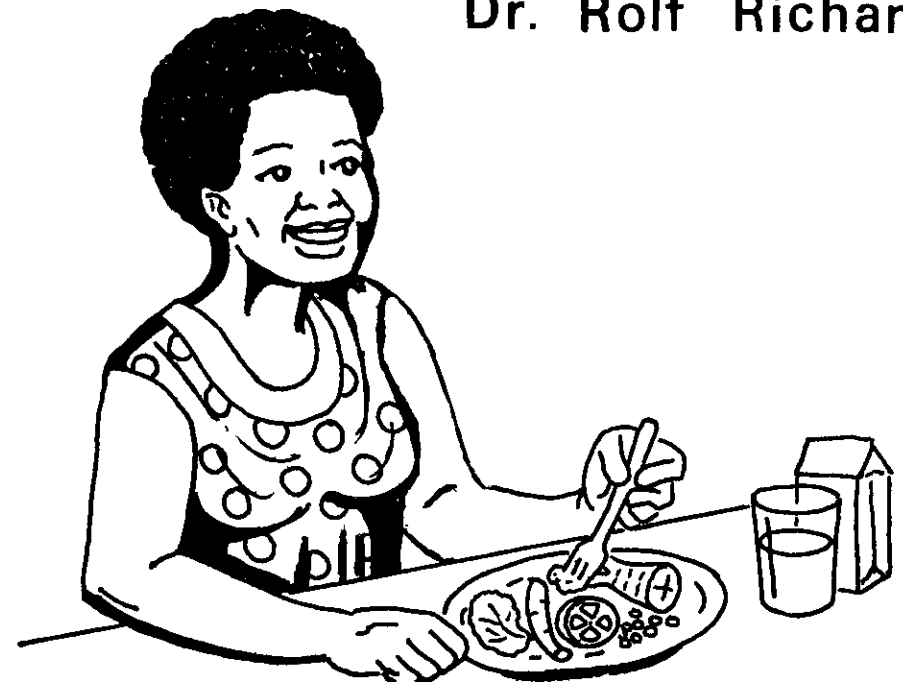


UNDERSTANDING DIABETES

a guide for the
caribbean

by

Dr. Rolf Richards



The Caribbean Food and Nutrition Institute (CFNI), founded in 1967, has as its goal the improvement of the food and nutrition situation in the seventeen member countries¹ through five types of activity: service, education and training; information dissemination; coordination and research. Each activity is carried out in close collaboration with the Governments.

CFNI is a Pan American Health Organization (PAHO) Centre. PAHO represents the World Health Organization in the Region of the Americas. The Institute is responsible to an Advisory Committee on Policy, on which the member Governments form the majority.

¹Antigua, Bahamas, Barbados, Belize, British Virgin Islands, Cayman Islands, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent, Suriname, Trinidad & Tobago, Turks & Caicos Islands.

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- often. Weekly inspections of the toes, both between and underneath, should be done by all diabetics for early recognition of ulcers, etc. Well fitting, loose shoes are important for the diabetic to prevent problems of the feet. Diabetics should not wear rundown shoes or socks with holes and should *never* walk barefoot even at home. When they buy new shoes they should be sure to break them in slowly, and after each wearing they should inspect their feet for blisters or sore spots.
4. *All* diabetics should have their eyes examined periodically. Diabetes can affect both the lens of the eye, causing cataracts which prevent light from getting into the eye, or that area of the eye (the retina) which receives the light and interprets what is seen. Regular eye examinations can detect the earliest changes in the eye so that steps can be taken to stop their progress.
 5. *All* diabetics should learn how to care for their syringes and needles properly and should be taught to give their insulin injections on the outside of their thighs and the lower part of the abdominal wall *only*, as these are the safest sites to administer insulin.
 6. *No* diabetic should stop his daily dose of insulin for any reason *except on medical advice*.
 7. *All* diabetics should keep as close as possible to their ideal weight for their height, age and sex. If they sit down most of the time on their jobs, they should try to get regular exercise. If diabetes is well-controlled it is possible for a person to be a diabetic and remain in good health without illnesses and complications, and to live a normal life span.

Diabetes is one of the most common illnesses among adult people in the Caribbean today. No other disease, including the common cold, causes more chronic ill health, disability, or time lost from work. The estimated death rate from diabetes in the Caribbean is higher than in other Western Hemisphere countries, and some seven times greater than in countries such as the United Kingdom and the United States.

WHAT IS DIABETES?

DIABETES IS A DISORDER OF THE BODY, WHICH MAKES THE BODY UNABLE TO USE CARBOHYDRATE (FOODS CONTAINING STARCH OR SUGAR) TO OBTAIN ENERGY.

A person suffering from diabetes is like a car that has petrol (gasoline) but cannot use it, as the spark plugs do not fire to burn the petrol for energy. If you run a car you will know that high octane petrol is easier to burn than ordinary petrol and produces more energy for less work. So your car will work more efficiently on high octane petrol. If, on the other hand, you were to use kerosene (paraffin) or heavy oil, your car would not run as well as it would on ordinary petrol.

The same thing happens to the body when it cannot use carbohydrate (starches and sugars) for its energy. If the body cannot use these energy foods for tasks such as walking, breathing and the working of heart and brain, etc., it must use other substances, such as fat. The process of breaking this fat down to energy is complex, more difficult, and takes more time than breaking down sugars. It also produces more waste products which cannot be eliminated fast enough, and so accumulate in the body. So a person suffering from diabetes is wasting the food he eats and may lose weight.

When we eat a balanced meal it usually consists of the following substances: carbohydrate (starches and sugars) from ground provisions, cereals, fruits, and green and yellow vegetables; protein in the form of meat, fish or chicken, dried peas and beans, cheese and milk; and fat, which may come chiefly from animals - pork, mutton, fish, etc., or from some seeds or nuts such as coconuts and peanuts. These are digested by juices in the gut and absorbed into the blood stream. All food eaten is absorbed into the body, no matter how much is eaten. When it is not used for energy it cannot be eliminated and so it is stored in the body as fat. It does not matter whether it is too much carbohydrate, too much protein or too much fat which is eaten, it is all eventually stored as fat in the body.

In the Caribbean the staple food substance is carbohydrate, such as bananas - green and ripe, eddoes/cocoas, cassava, corn, yams, potatoes, rice, also fruits like sweetsop/sugar apple, mango, naseberry/sapodilla, orange, etc. Carbohydrate is broken down to sugar and absorbed, and as this is of all the substances we eat, the easiest to break down, it quickly enters the blood. When the sugar in the blood rises above a certain level, it acts on a gland called the pancreas, or sweetbread, causing this gland to produce a substance called *insulin*. This insulin enables the sugar in the blood to enter the cells of the body where it is either used for energy or stored for reserve. The level of sugar in the blood then falls.

The sugar that is eaten is absorbed from the stomach and intestines into the blood; in diabetes, however, there is either no insulin at all or not enough to remove the sugar from the blood. Since the sugar cannot be used for energy, it collects in the blood until it spills over into the urine. In normal people sugar almost never gets into the urine, except sometimes in women *after* pregnancy,

If insulin reactions occur frequently the patient should see his doctor so that either his diet or insulin dosage can be adjusted.

ADVICE TO DIABETICS

1. *All* diabetics should wear or carry a card or bracelet with the words *I AM A DIABETIC* printed on it. This will save many lives, since doctors seeing patients for the first time who have been found unconscious, or have been involved in motor vehicle accidents, etc., will know exactly what to do.
2. *All* diabetics should have regular medical checkups about every 3 to 4 months, no matter how well-controlled their diabetes appears to be. Damage to the nerves, caused by diabetes, can be detected only by receiving regular medical examinations. Not only are the nerves of the limbs affected but the nerve supply to other parts of the body may also be affected. This nerve damage may cause sexual disturbances in both sexes. Since early loss of sexual drive may be an indication of poor control of the diabetes, medical advice should be obtained without delay.
3. *All* diabetics need to take special care of the feet since diabetes can affect the blood circulation and reduce sensation. All infections, cuts and bruises, especially around the feet and legs, should be treated with the greatest care, as cuts and bruises may cause damage to these limbs, making amputation necessary. Diabetics should *never* cut corns and callouses on their feet and toes with razor blades, pen knives, etc., or dig into the corners of toes, as this may lead to dangerous infection and loss of limbs. As the diabetic may not be aware that anything is wrong with his feet he should examine them

Like insulin, these tablets have dangerous side effects and should not be used by people without medical advice. They may produce severe skin rashes, liver damage if the patient has liver disease, and when not properly supervised, may cause the level of sugar in the blood to fall dangerously low (this is what happens in green ackee poisoning). This can be *very serious*.

WHAT IS AN INSULIN REACTION?

If the diabetic taking insulin forgets to take a meal or misses a meal, takes the wrong dose of insulin, or takes a larger dose than that prescribed by the doctor, he may have an insulin reaction.

In the early stages he may feel anxious or as if something is going to happen; he may have a headache, pounding of the heart, sweating and weakness. If nothing is done in about half to one hour, the patient becomes confused and may act in an aggressive or drunken manner and then go into a coma. When he is in a coma he may start having fits.

When these symptoms occur, if the patient takes something to eat or drink his symptoms will clear up rapidly. This is why the diabetic patient on insulin is advised *always* to carry a few cubes of sugar, sweets or sweet biscuits in case this happens. If he becomes unconscious, the injection of some glucose into a vein in the arm will also cause a prompt return to consciousness.

Insulin reactions tend to occur most commonly either in the late morning, after taking insulin, or during the period between 10.00 p.m. to 6.00 a.m. - the longest fasting period in the average person's day. Again this is why the diabetic is advised to regulate his diet in such a way that he has a snack at bedtime.

when they are breastfeeding. There are very few other and rare occasions when sugar may get into the urine and this condition is not due to diabetes.

As the sugar in the blood increases, some sugar is excreted in the urine. To excrete the sugar, water is taken from the tissues causing the patient to pass large amounts of urine at frequent intervals. Having lost all this water, he now begins to feel thirsty so he drinks large quantities of water. This is like what happens after strenuous exercise when a person perspires heavily and so loses water from his body. It explains why the patient with diabetes most commonly complains of always being thirsty, passing large amounts of water and losing weight.

WHO GETS DIABETES?

1. Diabetes runs in families. In Jamaica, for instance, about 30% - 50% of patients suffering with diabetes have relatives also suffering from this disorder. If both parents develop diabetes during their lifetime, there is a ten times greater chance of their children developing diabetes than if neither parent has the disease, so that there is a tendency for diabetes to occur in families.
2. A person may suffer damage to the pancreas from infection which destroys the cells that produce insulin.
3. A person may have his pancreas removed by surgery for various reasons, and so there will be no insulin-producing cells.
4. The more carbohydrate eaten, the more likely is a patient to get fat and so develop diabetes. The cells which produce insulin in a person's body may become exhausted by having to work too hard

because too much carbohydrate is being eaten over a long period of time. The cells may then fail to produce any more insulin in later years, which may cause obesity. In the Caribbean people generally eat more food than is necessary for the energy they burn, and this is particularly common among middle-aged people and among women after their childbearing period has ended. Consequently, the highest incidence of diabetes occurs in *middle-aged women* over the age of 40.

5. If a person drinks bush teas, sometimes dangerous substances from these teas may damage the pancreas and so produce diabetes. *ALL BUSH TEAS ARE DANGEROUS AND SHOULD BE AVOIDED.*
6. Too much alcohol drinking will not only damage the liver, but will also cause damage to the pancreas, and it is known that the incidence of diabetes is higher in alcoholics and heavy drinkers than in people who do not drink at all or drink only occasionally.
7. Very rarely certain disturbances of other glands in the body may cause the blood sugar to rise and produce symptoms of diabetes in some persons, but these are extremely rare causes of diabetes.
8. Some children and adults develop diabetes. However, it has not yet been determined why they do not produce insulin or why the insulin does not work properly.

WHAT DOES DIABETES DO TO THE BODY?

Diabetics catch infections more easily than non-diabetic people. Skin, chest, and kidney infections, leading to serious damage of all these organs, affect many diabetic patients.

different brands of insulin of different strengths which can be bought on the market today. In Jamaica, for instance, there is U 100, both in the soluble and long acting preparations, so the syringes used for this brand will have to be calibrated for U 100 insulin. Any other syringe *should not be used.*

3. TABLETS

Tablets for controlling diabetes have been in use for some time, but only certain types of diabetic patients can use them. All diabetics will not respond to tablets in the treatment of diabetes. Almost no diabetic under the age of 30 will be, or can be, controlled by tablets.

Tablets can sometimes be used in the treatment of the middle-aged diabetic, *but taking tablets is not a substitute for a diet.* All patients, whether on tablets or on insulin, *must* follow their diets closely at all times.

Some tablets act by stimulating the insulin-secreting cells in the pancreas to produce more insulin. So for them to control the diabetes, there must be cells capable of producing insulin. If these cells are totally destroyed these tablets will not work, and this is why some patients do not respond to tablet treatment.

There are other tablets produced which act in the body when taken the way insulin does, that is, they make the cells in the body take up sugar from the blood. Again, however, these tablets will not work in most young diabetics and in some of the older diabetics. This is why some diabetics *can be controlled only by insulin and nothing else.*

2. INSULIN

This insulin is given by injection to replace that which diabetics can no longer normally produce. Unfortunately, if it is swallowed, it is digested in the stomach and does not work. So insulin can only be given by injection. There are many different brands of insulin available to diabetics and their uses depend on what kind is most suitable for each patient. The types most commonly used are the soluble insulin, and preparations of insulin to which various chemicals are added. When the soluble insulin is injected, it begins to act in about one hour and lasts for about six hours. So when using this preparation it will have to be given three to four times a day. Those types which are produced with chemicals release the insulin slowly over a period of 24 hours. These injections can then be given about one hour before breakfast in the morning and will last for approximately 24 hours - *no longer* - so they must be taken *every* day. If a person eats every day he must have insulin to act on the sugar which is eaten every day.

The aim with insulin is to keep the urine free from sugar at all times, or to lower the blood sugar level two hours after a meal. The practice of taking insulin only when sugar appears in the urine is wrong and leads to many complications and dangers. The dose of insulin should be adjusted, like the diet, to keep the patient's urine free from sugar and his weight constant for his age, height and sex. This should be done only by a doctor. Also, no diabetic should ever attempt to take insulin without the advice of a doctor. The use of insulin supplied by persons other than one's doctor is a dangerous procedure.

It has now been agreed by the International Diabetic Association that all insulin preparations will be of one strength, that is 100 units/ml (c.c.). This will remove the confusion over having

Because it cannot use the sugar taken in, the body is like a machine which does not work properly. In an attempt to obtain energy the body breaks down its own fat and protein. These produce an excess of waste products which in diabetics, damage the small blood vessels in the body, the heart and the large blood vessels, leading to "heart attacks", cataracts and blindness, high blood pressure, kidney damage, damage to the feet causing amputation and damage to the nerves, including the brain and the nerve supply to other parts of the body.

CAN DIABETES BE CURED?

The answer is **NO!!** *ONCE A DIABETIC ALWAYS A DIABETIC.* If a patient who is extremely overweight develops diabetes, *and he loses weight by reducing his food intake*, the insulin-secreting cells may recover enough to appear to be cured. If, however, he were to eat too many starches and sugars and put on weight again, he would once more start showing symptoms of diabetes.

HOW CAN WE TREAT DIABETES?

All diabetics should have regular medical attention. Before starting treatment the doctor will first try to find out how serious the patient's diabetes is. In young people, when diabetes first occurs, it is usually very serious and sudden and if it is not treated quickly it will cause early death. However, in most people it is slow to start, developing without the person's knowledge over a period of weeks or months and needs time to be controlled.

The most important factor in the successful treatment of diabetes is the patient's understanding of the disease. He should understand that the aim in treating diabetes is to keep healthy, and

ensure that the urine is kept free from sugar at all times. He should cooperate with his doctor at all stages of his treatment, since no person without medical knowledge, no matter how intelligent he is, is completely capable of treating his own diabetes.

There are no known "quick" or other types of cures for diabetes. The use of herbs and bush teas in the cure and treatment of diabetes can cause more misery, complications and deaths than no treatment at all and should be avoided. Some of the popular herbs used in treating diabetes affect the level at which sugar spills from the blood into the urine. In other words, if the kidneys are made to spill less sugar than before, then even when the level of sugar in the blood is too high or higher than normal, it will not show in the urine. The herb makes you believe that you do not have a high blood sugar level by affecting the kidneys so that the urine shows no sugar while the damage from the high blood sugar level gets worse.

HOW IS DIABETES CONTROLLED?

1. DIET

When the doctor decides that his patient's diabetes can be treated slowly over a period of days or weeks, the patient is put on a diet. This diet can usually be adjusted so that most people will be able to afford it, so no one need neglect his diabetes because of financial reasons.

The total amount of food taken a day must be adjusted to the patient's age, height and weight at the time of examination, and to the amount of energy he needs, depending on his occupation.

Energy is measured in units called calories. The amount of energy, or number of calories a person needs depends upon his age, sex, occupation and other factors. For example, a growing child

needs proportionately more food for energy than an adult and a manual labourer will need more food for energy than a clerk in a shop. The daily calorie requirements range between about 1,000 for an infant and 3,000 for a young man. A very active man, such as a canecutter at croptime will need considerably more than this - up to 4,000 calories per day - while a person engaging in light activity such as a sedentary job, or who is obese and needs to lose weight, will need less than the average. Women usually need between 1,760 and 2,300 calories and during pregnancy and while breastfeeding they need more.

Using this as a guide, it can be easily worked out how many calories a patient must eat to get enough energy without eating too much. In controlling diabetes, it is just as important not to eat too few as it is to eat too many calories.

Fat should be restricted as much as possible, as there appears to be some relationship between the amounts and type of fat we eat and heart disease. We have already seen that diabetics are prone to develop heart disease.

When the patient has been put on the correct diet, if this is all that is necessary, and is about the correct weight for his height, sex and age (he should reach his maximum expected weight for height and sex at about 25 years of age), the doctor checks the urine and blood sugar levels. If these are both within normal limits, then, providing the patient is not gaining weight and follows his diet carefully, this will be all that is necessary for controlling the diabetes. If, however, after two to three weeks on a diet the symptoms do not improve, the obese patient is not beginning to lose weight or the sugar levels in the blood and urine are still high, then diabetes has to be controlled by lowering the diet, that is, taking in fewer calories. If there is still no improvement the doctor will advise controlling the diabetes not only by diet, but also by the use of insulin, or the use of tablets.