



DiabetesWatch

A publication of the PHILIPPINE DIABETES ASSOCIATION, INC. for the Filipino diabetic patient

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OBESITY AND DIABETES The Devastating Duo

Overweight is defined as body weight in excess of normal or standard weight for a given height. Most authorities accept that body weights exceeding ten percent of the normal or standard values can be considered abnormal or overweight. On the other hand, obesity refers not only to a state of overweight but also to an abnormally high percentage of body fat.

A number of factors are known to influence the amount of body fat that a person has. These factors include age, sex, physical activity, genetic predisposition, and availability of food. Of these factors, availability of food is most affected by socio-political and economic conditions. For example, during periods of food scarcity as in war or in famine, there is a general decrease in body weight of the population with consequent reduction in incidence of obesity. During periods of plenty, as in post-war eras, the incidence of obesity sharply rises again. It is very striking and noticeable that during those same periods of scarcity, the incidence of diabetes drops only to rise again as the period of peace and plenty supervenes.

Among the diabetic patients diagnosed after the age of 30 years, a common denominator in 80-90% of them is a body weight that is more than 15% of the ideal or standard weight. This finding leads us to the question: Is the occurrence of obesity and diabetes coincidental or directly causal? The subsequent discussion hopes to enlighten this aspect of the disease.

Insulin is the key hormone or substance in the utilization of sugar or glucose by the different organs of the body. Among obese persons, there is a notable resistance or relative insensitivity to the effects of insulin. This then leads to a need for higher insulin levels to maintain the proper metabolism of carbohydrates, fats, and proteins in obese persons. In contrast, non-obese individuals are very sensitive to insulin effects, so that even at low insulin levels, their metabolism of the different food nutrients proceeds normally. What happens next in the obese body is that the blood sugar or glucose accumulates because the organs are not able to utilize or metabolize it for energy production. This excessive sugar in the blood spills off into the urine causing the patient to void frequently and feel thirsty most of the time. The sugar that goes into the urine usually attracts ants, thus calling attention to the probability of diabetes in the obese person.

Inasmuch as the body organs or tissues cannot use the sugar or glucose as an energy source because of their insensitivity to insulin, they will turn to the fat stores instead. This will not prove to be good for the person because in the breakdown of fats as a source of energy, certain acids and noxious substances are produced as by-products thus destroying the body equilibrium. What we will see then is an obese individual who starts to lose weight and literally wastes away as the diabetes progresses.

(Continued on page 2)

IGT, A New Kind of Diabetes?

The diagnosis of diabetes must be done with care because it is considered a major event in the life of any person affected. In most patients the diagnosis can be made easily because of certain characteristic symptoms a patient may complain of, the presence of glucose in the urine and definitely high concentrations of glucose in the blood. There are instances in which the diagnosis is in doubt and a glucose tolerance test usually gives definite results.

In the past, the diagnosis was essentially an all or none matter. But nowadays, it must be made only after consideration of data collected by trustworthy means. The National Diabetes Data Group of the U.S. modified this practice by establishing the category of impaired glucose tolerance which is the gray area between the normal glucose tolerance and diabetes, for the reason that overdiagnosis may affect an individual's lifestyle and insurability unnecessarily. Patients with impaired glucose tolerance have fasting plasma glucose (FPG) levels lower than that required for the diagnosis of diabetes, but in whom, during an oral glucose tolerance test, the 2-hour value lies between the normal and

diabetic values; that is, FPG of less than 140 mg% and a 2-hour value between 140 and 199 mg%. An individual is considered a diabetic if his/her FPG = 140 mg% or more on more than 2 occasions and a 2-hour value over 200 mg%.

The impaired glucose tolerance (IGT) class has in the past been given by clinicians the designation of chemical diabetes, latent diabetes, glucose tolerance diabetes, subclinical, asymptomatic, borderline diabetes or simply diabetes. Such terms, we do not use these days. It is a different class from real diabetes because they have relatively benign characteristics although they are regarded at a higher risk of development of diabetes than persons in the general population. Prospective surveys have shown that conversion from IGT to frank diabetes occurs with significant frequency. 1-5% of individuals with IGT would later progress to overt clinical diabetes per year and that many will return to normal glucose tolerance spontaneously. In some subjects, IGT may represent a stage in the natural history of diabetes. In such patients conversion of IGT to diabetes has taken years or decades. Diabetes

(Continued on page 3)

Blood glucose values considered diagnostic for diabetes mellitus and impaired glucose tolerance (IGT) in nonpregnant adults

	Normal	IGT	Diabetes Mellitus
FPG	Less than 115 mg/dl	less than 140 mg/dl	greater or equal to 140 mg/dl
2 hours glucose load	Less than 140 mg/dl	140-199 mg/dl	200 mg/dl and over

WHY EXERCISE?

... its benefits to the diabetic patient

Since the early demonstration of the sugar lowering effect of exercise, it has been a useful adjunct in the management of diabetes mellitus. In this article, we will discuss the different benefits of exercise and the precautionary measures employed for certain subsets of diabetic patients. Based on the above discussions, specific guidelines will be outlined to allow patients to enjoy full participation in exercise while receiving the maximum health benefits.

Benefits

Physical training may increase insulin sensitivity, thus it could improve glucose tolerance in non-insulin dependent diabetics. Insulin-dependent subjects may lower insulin requirements by exercising due to its glucose lowering effect. Obese patients get an additional benefit of weight reduction from physical training.

A potentially important role of exercise is in the prevention or retardation of cardiovascular diseases and its complications. Cardiovascular mortality in diabetic patients aged 40 to 73 years is approximately twice of the general population. Associated with this is an increase in other coronary risk factors such as hypercholesterolemia, obesity and hypertension.

Several studies suggest that exercise diminishes nearly all of these risk factors. In addition, physical training has been shown to enhance the ability of the heart of experimental animals to withstand stress.

Other reported beneficial effects include a promotion of a sense of psychological well-being and appetite suppression.

Precautions

Exercise is not totally innocuous and special precautions should be emphasized. Guidelines are outlined in Table I.

Before starting an exercise program, all patients should be screened thoroughly. Those above 40 must receive some form of formal exercise stress testing prior to starting an exercise program because of the high incidence of clinically silent cardiovascular disease. A graded slowly increasing workload is suggested.

Hypoglycemia (very low blood sugar) may occur with exercise. Oftentimes, adjustment in insulin dosage or the ingestion of carbohydrate before or during exercise is required to avoid exercise-induced hypoglycemia. It may also be beneficial to inject insulin away from the site of muscle activity, e.g. abdomen, to avoid the rapid mobilization of depot insulin. Patients

who exercise should always carry adequate identification and a source of readily absorbable carbohydrate (e.g. hard candies, softdrinks) should hypoglycemia occur. Alcohol and beta-blockers (blood pressure pills) must be avoided because they may aggravate the risk of developing hypoglycemia.

A further increase in blood sugar can occur in uncontrolled diabetics. Physical training is therefore better prescribed in well controlled diabetics.

Self blood glucose monitoring is a useful and simple method to document individual responses to particular exercises. It can be used to assess different strategies e.g. altering insulin dose and nutrient intake to optimize blood sugar control.

Diabetic patients may have problems unrelated to blood sugar levels. Less well-controlled subjects are particularly prone to dehydration when exercising on warm days. Those with significant loss of foot sensation should choose exercises other than jogging. Subjects engaged in running programs should be provided with soft, comfortable footwear. Diabetic nephropathy (kidney disease) may be aggravated since exercise decreases blood flow to the kidneys and increases protein excretion. Those with severe eye prob-

lems (proliferative retinopathy) should be discouraged from engaging in exercise due to the risk of hemorrhage.

In summary, exercise can be a pleasant and safe therapeutic adjunct for diabetics if certain precautions are taken. For many of our diabetic patients, the benefits far outweigh the risks.
E.T.S.

Obesity ... (from page 1)

Although the degree of obesity is not always proportionate to the severity of the diabetes, it is worthwhile to note that the duration of obesity may have some bearing on the symptoms appearing earlier in the life of the person who is prone to diabetes.

Many researches have shown that dietary restriction and subsequent weight reduction promote the return of the sensitivity of the body organs to the effect of insulin. This leads to proper utilization of the blood sugar by the tissues of the body thus preventing the undue accumulation of sugar in the bloodstream. With proper utilization of this sugar or glucose, the body does not have to turn to breaking down its fat stores for energy production.

This clearly illustrates that the link between obesity and diabetes is not a chance or coincidental one but rather a direct and causal relationship.

L.A.-Q.

Table I
EXERCISE PROGRAM GUIDELINES

- Before starting an exercise program, evaluate diabetes control and screen for heart disease, hypertension, kidney disease and severe eye problems.
- Prescribe a graded, slowly increasing exercise.
- Self blood sugar monitoring is helpful to assess the need for insulin or food intake adjustment during exercise.
- Avoid exercising during the height of insulin action.
- Exercising limb or part of body should not be used as an insulin injection site.
- Adequate identification and ready sources of easily absorbable carbohydrates are needed in exercising diabetics should hypoglycemia supervene.
- Correct footwear should be worn during exercise especially when engaged in running programs.

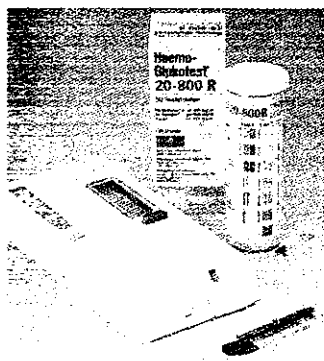
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Chlorpropamide	8-10	30-60	22-45	4 (active)	100% in 10-14 days
Glibenclamide	2-5	10-16	16-24	6 (partially active)	58% in 1 day 95% in 5 days
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IGT... (from page 1)

tes has been found to occur in 10-70% of patients with IGT followed for 14 years. Thus IGT is an important entity which should not be ignored or taken lightly. IGT patients should be followed up regularly and treated actively.

Even if progression to frank diabetes does not occur, individuals with IGT may have an increased risk of microangiopathy (atherosclerosis or hardening of arteries) but do not have significant risk of developing eye or kidney complications of diabetes. Many studies have shown that aside from increased death rate and increased occurrence of arterial disease in IGT patients, ECG abnormalities or increased susceptibility to atherosclerotic disease associated with other risk factors including high blood pressure, high cholesterol and triglycerides exist.

Attempts have been made to prevent or postpone IGT conversion to diabetes. In the obese, IGT almost invariably reverts to normal glucose tolerance

LETTER

I have been diabetic now for 6 months. I was diagnosed by accident while helping on a British Diabetic summer camp.

Since being diagnosed, I have been writing to diabetics here in Britain and I would like to write to diabetics from other parts of the world. I was wondering if you could help me by putting me in touch with diabetics from your country.

My name is Alison Christer. I am 23 years old, nearly 24. I work here at Pilgrim's as a housemother looking after children age 10 to 16+ who all suffer from severe asthma, eczema, cystic fibrosis and more recently unstable diabetes.

My hobbies include photography, canoeing, swimming, reading, writing, cooking, sewing, sport, (especially football), driving, knitting.

I hope you can help me in this matter.

Alison Christer
Pilgrim's School for Asthmatics
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range with weight reduction. In some studies, the combination of oral tablets for lowering glucose (sulfonylureas) and diet tended to yield the most pronounced reduction of blood glucose and serum lipids.

Based on these studies, it is necessary to identify patients with IGT for treatment. T.D.-C.

NOVOPEN™ — MAKES LIFE EASIER FOR DIABETIC PATIENTS

Novo has just launched its new, revolutionary insulin injection system NovoPen in the Philippines. This device at the same time provides the diabetics with a more efficient and more convenient form of insulin treatment than systems currently in use.

In conventional insulin treatment, the diabetic patients receive one or two daily insulin injections in order to control their blood glucose (blood sugar). But a stringent scheme for the size, composition and timing of their meals, and of exercise, must be adhered to in order to prevent hyper or hypoglycemia (too high or too low blood glucose).

During the past 10-15 years there has been increasing interest in alternative ways of insulin administration which closely mimic the insulin pattern in non-diabetics. The aim has been to achieve better control and to alleviate some of the restrictions in diet and lifestyle required by conventional insulin treatment.

Clinical investigations have shown that almost normal insulin and glucose levels may be obtained by giving one daily dose of long-acting insulin to provide a 24 hour "basal" insulin level, combined with small doses ("boluses") of rapid-acting insulin before each meal. Each bolus can be adjusted to the meal size desired by the patient. This "basal/bolus" principle makes it possible to achieve a hitherto unknown flexibility in the timing, size and composition of the meals compared with conventional treatment. In fact, a major change in the lifestyle of the diabetic may take place.

However, it is inconvenient for the diabetic to carry a complete injection system consisting of syringe, cannula, insulin vial, etc. around and to administer this equipment several times daily.

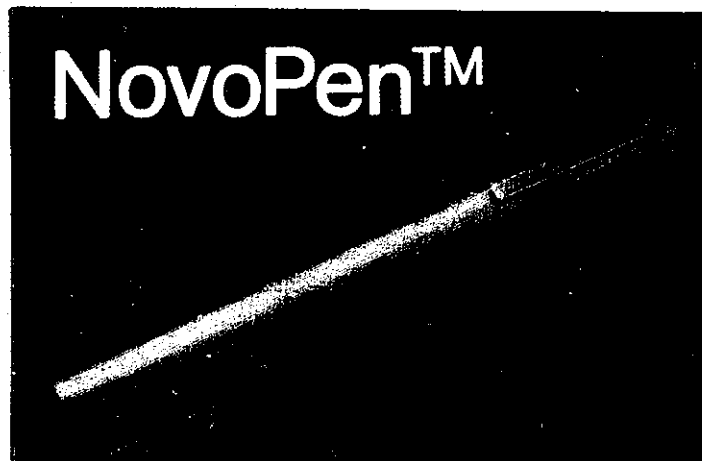
Novo, therefore, developed NovoPen to simplify injections of rapid-acting insulin before each meal. NovoPen consists of a syringe the size and shape of a fountain pen with a replaceable cartridge containing rapid-acting insulin (Actrapid(R) HM Penfill(TM)). When the diabetic wants to take an injection, he removes the cap of the pen whereby the injection needle appears. The cap is screwed on at the opposite end of the pen. The injection is then made by pressing a button on the cap one or two times to give the required amount of insulin. Each time the button is pressed, two units of insulin are released.

After the injection the cap is replaced over the needle-end of the pen, and the device looks like a stylish fountain pen. The pen cannot be activated inadvertently when carried in the pocket.

NovoPen has already been launched in over 20 countries including Denmark, U.K., Ireland, West Germany, New Zealand, Canada, Hong Kong, Malaysia, Singapore and Thailand.

Numerous clinical studies have demonstrated that the vast majority of the patients preferred basal/bolus therapy to conventional therapy. They found that the convenience and flexibility in lifestyle achieved far outweighed the increased number of daily injections.

Novo is among the leading insulin producers in the world. It has a long tradition for development of highly purified insulins and was the first company to introduce human insulin which is identical to the hormone produced in the human body. Novo makes diabetes research at its research centre in Bagsvaerd and Hvidovre Hospital which yearly treats about 2,400 patients. Novo employs approximately 4,800 people worldwide and total sales revenue in 1985 was 4,118 million Danish Kroner (approx. US\$459 million).



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CAN DIABETIC PATIENTS UNDERGO SURGERY?

Like any other individual, the diabetic patient is often a candidate for surgery since many of them are in the older age group where the incidence of operations is greater than in the young. Furthermore, some conditions which require surgical treatment occurs more frequently in the diabetics such as occlusive vascular disease (narrowing of the blood vessels), gallstones, cataracts and infections.

Most diabetics are afraid to undergo any type of surgery for fear of poor wound healing, bleeding, and infections. Physicians are often asked: What are the risks involved? Will my wound heal? Of course the answer to these questions depend on each patient and his present state of health.

How does surgery affect each individual? Surgery constitutes a major stress that leads to change in the body

with secretion of various hormones that affect the glucose metabolism and increases insulin requirement. The ability of the body to respond to such stress depends on the existing status of the heart and other vital organs. Both wound healing and host defense against infection require adequate blood supply and nutrition. In diabetics with vascular complications, the blood supply to different organs is usually compromised. The necessary substrates (or nutrients) for tissue repair are unable to gain access to the site of injury. At the same time, high blood sugar with insulin deficiency can delay wound healing, promote infection and lead to nutritional depletion.

The risks of surgical complications in the diabetic population depend on several factors including the degree of diabetic control, the presence of diabetic complications (vascular diseases, heart failure, kidney diseases), and other associated medical disorders.

In a well controlled diabetic with no diabetic complications the risk of surgery approximates that of the general population. Immediate cardiac complications are rare with proper pre-operative assessment. Host defense mechanisms are generally intact and wound healing adequate in the presence of good blood supply. In a poorly controlled diabetic with no apparent complications, the risk of surgery may still be minimal if the patient is allowed sufficient time to achieve the best possible health and control of hyperglycemia prior to the surgery.

On the other hand, the presence of diabetic complications in an otherwise well controlled diabetic increases the surgical risk by several fold. The immediate risk of the surgical procedure relates to the

vascular complications affecting the heart (including heart failure, arrhythmia, severe high or low blood pressure), the kidneys (with fluid and electrolyte imbalance), and the brain (strokes). The delayed complications of poor wound healing and bleeding also depend on the degree of impairment of blood supply. With proper pre-operative preparation and the present advanced medical technology, the above problems may be prevented.

Pre-operative medical evaluation is extremely important in a diabetic patient. He should be prepared psychologically with discussion and reassurances. His metabolic status including his heart and kidney functions, nutrition and level of blood glucose control should be assessed adequately to ensure optimal management during surgery and prepare for possible problems that may arise. Elective surgery should be done only after adequate control of blood sugar.

With the present surgical technology and the availability of close monitoring, the impact of surgery on the diabetic patient has decreased markedly. Infections as a result of lowered body resistance in patients with vascular impairment can be controlled with antibiotic therapy. With adequate diabetic control, the problem with wound healing is uncommon. Surgical emergencies in the diabetic carries a much higher risk. However with the present medical facilities, rapid assessment and institution of proper pre-operative treatment can be done within a few hours.

Thus, surgery in a properly prepared diabetic patient can be carried out with minimal complications. With coordinated efforts of surgeon, anesthesiologist, and the internist, the diabetic patient is a suitable candidate for any type of operative procedure. R.T.G.

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