



DiabetesWatch

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

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FALLACIES REGARDING INSULIN BARED!

INSULIN is a substance normally produced by an organ behind the stomach called the PANCREAS. Together with such substances called HORMONES, insulin helps to regulate the use of food taken in and that stored inside the body, according to the needs of the individual during the 24 hour period.

There are two sources of insulin currently available in commercial quantities: animals like cattle and hogs, and bacteria specially grown or cultured in laboratories.

Since insulin is a protein it can not be given by mouth because stomach and intestine will digest and destroy it. Insulin therefore is administered by needle and syringe into vein or muscle or under the skin.

Over the years there have come up quite a number of wrong notions about insulin. Some of them border the ridiculous, but others are quite serious and deserve careful attention.

1. INSULIN IS NOT A CURE FOR DIABETES. "Once a diabetic always a diabetic". Reports of diabetic remissions, however, are not unusual and these can cover a few months or even a few years.

2. WHO NEEDS INSULIN REALLY? There are two types of diabetes — Type I and II. Type I diabetics hardly have any insulin in circulation and are therefore insulin dependent. They need two or more shots a day, otherwise they would go into diabetic coma. Type II or non-insulin dependent diabetics may go on diet alone or diet plus pills. Occasionally insulin may be needed, usually in doses of one shot a day although some may have to have more than that. Doctors usually do not give insulin to overweight diabetics but put them on rigid diets instead . . . with pills at times. They fare much better on this kind of schedule.

Acute emergencies and surgery, on the other hand, may be indications for

the temporary use of insulin in Type II diabetics. Pregnant women as a rule are given insulin whether they are Type I or Type II.

3. DOES GIVING INSULIN TO A TYPE II DIABETIC MEAN THAT THE PATIENT IS GETTING WORSE? THAT THE SITUATION HAS GOTTEN MORE SERIOUS? THAT THE PATIENT WILL HENCEFORTH BE ON INSULIN ALL THE REST OF HIS LIFE? THAT THE INSULIN DOSE WILL KEEP ON GOING UP? NO!

The underweight Type II diabetic patient who can not be controlled with oral agents would be given insulin until he gains normal weight with normal blood sugars. *Control of blood sugar is essential to prevention of future complications.* Insulin administration does not necessarily mean worsening of the patient's condition. Many, patients, especially the normal and the overweight, may have to use insulin temporarily and then be taken back to pills later on. Some Type II diabetics however after a long period of absence of control may stimulate Type I diabetics and have to go on insulin for indefinitely. "Once on insulin always on insulin" is not a correct statement.

The patient on insulin is not a worse patient compared to the one on pills. There are patients on insulin who do not have a single demonstrable complication, while there are patients on pills who have bad eyes, bad kidneys, bad hearts, bad nerves, or bad limbs secondary to the diabetes. So presence or absence of insulin in the patients' regimen is no indicator of severity of the diabetes.

Once started, doses of insulin have to be adjusted regularly because INSULIN REQUIREMENTS DO CHANGE IN THE SAME INDIVIDUAL. There will be times that will require increases as there will be times when the insulin might have to be reduced. Starting a patient on insulin need not mean con-

tinuous increases in dosage.

4. GENERAL EXPERIENCE INDICATES THAT PATIENTS ARE "AFRAID" OF INSULIN ALSO BECAUSE OF THE FOLLOWING REASONS:

- a. pain of the needle
- b. cost of insulin, syringes, needles, cotton, alcohol, etc.
- c. who will give the shot especially if self injection is not possible.
- d. inconvenience especially if patient needs more than one shot a day and patient has to travel.
- e. need for self blood glucose monitoring especially if more than one shot a day
- f. insecurity regarding adjustment of doses and possible hypoglycemia. Some deaths have been attributed to hypoglycemia but these are generally due to overdosage of insulin. This need not happen among patients who are properly monitoring themselves.
- g. confusion over the various kinds of insulin
- h. assumption of greater responsibility for self care

5. THERE ARE OTHER REASONS FOR PATIENTS' DREAD FOR INSULIN

- a. insulin can cause impotence or sterility
- b. insulin is addictive
- c. insulin can cause varying complications

Of course all of these are groundless fears.

6. THERE ARE CERTAIN WRONG ATTITUDES AND PRACTICES WHICH WE HAVE TO CORRECT

- a. *Insulin is given to diabetics like penicillin for pneumonia and aralen for malaria.* No two diabetics are alike and insulin needs can not be predicted, even if the two have similar blood sugars.
- b. *The once a day dose is sufficient.*

(Continued on page 4)

*The Treatment of Diabetes Mellitus:***THE CHOICE IS YOURS!***(Part I)*

Unlike the treatment of most diseases wherein the success of management is principally the physician's responsibility, the end result of a diabetic's life will depend largely on him. At the start, when he is diagnosed a diabetic, the physician's role may be a major one as he educates and guides him in the principles of management, but as times goes on, it is the diabetic who lives with his disease day by day and year after year. The choice, therefore, is with him i.e. to follow a long, narrow and maybe tortuous path wherein his chances of living a long and useful life maybe the same as a nondiabetic, or follow a wide and a easy path where his life may be shortened by renal or cardiac disease or the quality of his life curtailed by blindness, gangrene or paralysis. According to Crofford of the National Commission on Diabetes, in comparison to nondiabetes, the diabetics have 25 times more incidence of blindness, 17 times higher risk of renal failure, 5 times greater incidence of gangrene and twice the risk of myocardial infarction!

Aims of treatment: The immediate aims are: 1. To overcome the characteristic symptoms of frequent urination, thirst, vulvar pruritis, etc. 2. To increase resistance to infection. 3. Prevent ketoacidosis and coma particularly essential in Type I diabetic and 4. Promote normal weight and strength. Then, after the immediate aims are achieved, the greater and more challenging task is: to prevent, postpone or minimize: 1. Vascular disease involving the eyes, kidneys, brain, heart and extremities 2. Neuropathy involving the peripheral nerves i.e. numbness, needle prick sensation and/or diminished sensation of fingers, toes, plantar surface of feet, night cramps; affection of the autono-

mic nervous system, i.e., diarrhea especially occurring at night, inadequate emptying of the urinary bladder, impotence, etc. Recent studies both in experimental animals and in humans reveal that the only way to achieve these aims is to have ideal control of the diabetic's state, which means normal blood glucose, not only when fasting or after a meal, but 24 hours a day.

The emphasis in the management of diabetes, must rightfully be attention to proper education of the patient so he can properly be motivated and therefore conform with proper management.

Education should involve 1. Acceptance that he is a diabetic and resignation to the fact that he will have to live with the disease the rest of his life, 2. Understanding of what the disease is, 3. Acquiring a basic but practical knowledge of the principles of treatment, 4. Awareness of the acute and chronic complications of poor control, 5. Appreciation of the rewards of excellent control.

Common in the treatment of patients which abnormal glucose tolerance, whether he be Type I or Type II, are the mainstays of 1. Diet, 2. Exercise 3. Maintenance of normal weight. The antidiabetic agents, insulin or tablets are indicated when these three are unable to achieve the desired control.

Diet Principles: The diet should 1. Be suited to individual needs as to total caloric requirement, personal preferences and habits, ethnic peculiarities. 2. Provide balanced proportions of carbohydrates, fats and proteins. Simple sugars should be avoided; polyunsaturated fats, like corn or olive oil, should be used instead of animal fat, and food with high fiber content should be taken. 3. Provide approximately the same

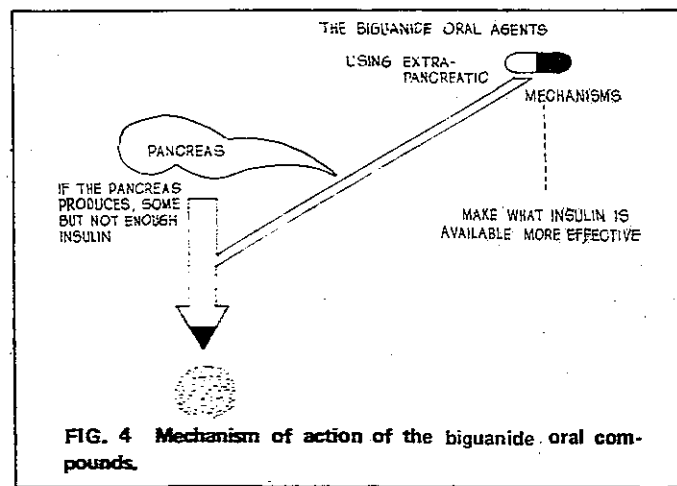
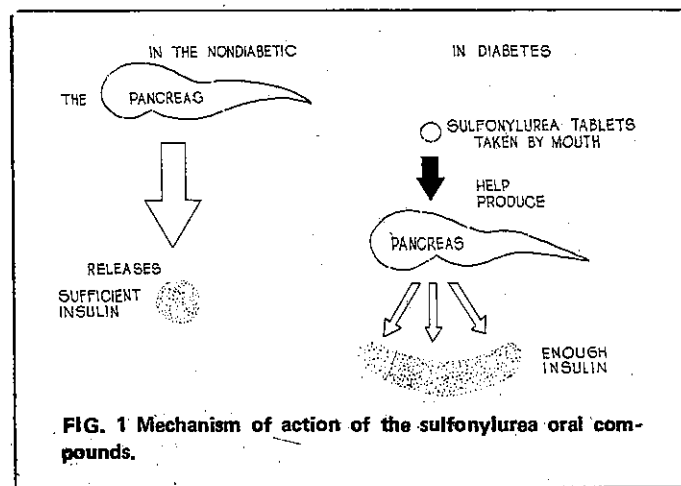
amount of food each day so that when needed the proper dose of antidiabetic agent can be given. 4. Food intake should be spread out during the day. Missing or taking less than the prescribed amount in a meal may lead to hypoglycemia especially in those taking insulin or tablets. 5. Proper counselling and instruction by the doctor or by a dietician not only at the start of treatment but in subsequent followups is essential to determine whether the patient understands and follows the diet. Regular weighing of the patient may provide a clue as to how well his diet is followed.

Exercise helps significantly in bringing down the blood glucose levels, as this increases body sensitivity to insulin making whatever insulin is in the circulation more effective. In obese patients, together with a controlled diet, exercise will contribute in reduction of weight. However, in poorly controlled diabetes, exercise can intensify hyperglycemia and ketogenesis and thus be a danger to a Type I diabetic. It is, therefore, an adjunct rather than a substitute for proper management. In patients with good control, exercise may induce hypoglycemia. This can be avoided by taking extra carbohydrates before the exercise; and in those taking insulin by using non-exercised insulin injection sites and when necessary, lowering insulin dose.

The Use of Oral Antidiabetic Agents:

1. These are indicated in Type II — Noninsulin dependent diabetics.
2. After control with diet and exercise fails especially in the obese patient.
3. Avoided in patients with liver, kidney or heart disease.
4. Discontinued when good control cannot be achieved or maintained and shift to insulin is necessary.

The Oral Antidiabetic Agent of Choice will depend on whether the patient is Type II — nonobese (Type II a)



wherein the sulfonylurea group of agents is indicated or Type II - obese (Type II b) wherein the biguanides will be most beneficial.

At the start of treatment of the non-obese patient, the sulfonylureas will help produce enough insulin and thus lower blood glucose levels (Fig 1). As duration of treatment is prolonged, these drugs also increase the effectivity of the action of insulin in the different body cells contributing further to the control of diabetic state. As one of the action of insulin is to promote lipogenesis, these drugs would help the lean, underweight patient achieve his desired ideal weight.

On the other hand, biguanides act by making insulin more effective (Fig. 2). Obese Type II diabetics have adequate insulin in the circulation and are best benefited by these drugs. Biguanides also help in reduction of weight by diminishing glucose absorption in the gastrointestinal tract and by diminishing the appetite because of a peculiar taste they give. However, great caution should be practiced in the use of these drugs as they can lead to a serious complication called lactic acidosis. This is the reason why they had been withdrawn in the United States and in other countries. They should not be given in patients with impaired liver/or kidney

function and in those with cardiac or lung diseases which would interfere with proper oxygenation of the blood. Studies by Alberti, *et al* have shown that among the biguanide preparations, metformin causes the least increase in lactic acid levels in the blood.

MOST COMMONLY USED ORAL ANTIDIABETIC AGENTS IN THE PHILIPPINES

Sulfonylureas

Tolbutamide	-	Rastinon
Acetohexamide	-	Dimelor
Gliclazide	-	Diamicron
Glipizide	-	Minidiab
Chlorpropamide	-	Diabinese
Glibenclamide	-	Euglucon, Daonil, Semi-Euglucon

Biguanide

Metformin	-	Glucophage
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Reasonable Approach to the Obese Diabetic: - 85% of diabetics are Type II and 60-90% of these are obese. Attention should be given to:

1. Medical history which should include detailed description of caloric intake, eating habits and weight gain history. Social, cultural and family background should also be noted. Correction of factors leading to and causing obesity should be seriously undertaken.
2. A diet with limited and reasonable

weight reduction goals should be prepared. A hypocaloric diet consisting of high protein foods and fiber is the most rational and most efficacious.

3. A regular program of graded exercise should be instituted.
4. Behavior modification is also recommended, such as the patient should be taught to eat high roughage and low caloric foods such as celery and carrots when anxiety or unavoidable food exposure is encountered. A very important factor is frequent follow-up and positive reinforcement by his physician, relatives and friends.
5. Therapy of the diabetes with oral agents or insulin should be reserved for patients in whom control cannot be established in a reasonable period of time in spite of all the other measures previously stated. (AV-C)

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long term prognosis

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(GLIPIZIDE)

IN NON INSULIN DEPENDENT
DIABETES MELLITUS

Dosage:

Patients treated for the first time:

It is advisable to start with 1/2 (2.5mg) or 1 tablet (5 mg) according to blood sugar levels, raising the dosage as necessary over the next few days until balance is achieved.

Patients previously treated with oral hypoglycaemic agents:

The dosage will naturally depend on the patient's clinico-metabolic condition and on the treatment received previously. Generally speaking, however, one Minidiab tablet replaces one tablet of all other oral antidiabetic agents.

Patients receiving insulin treatment:

Minidiab maybe used in place of insulin in patients not requiring daily doses of more than 30-40 units. In cases calling for larger amounts, Minidiab maybe used to reduce the insulin requirement considerably, at doses which should be determined individually on the basis of each patient's clinical response.



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Fallacies . . .

(Continued from page 1)

for all diabetics. One only needs to increase dose in some cases. There are diabetics who need only one shot a day, but there are those who must have two shots or more a day. Merely increasing the dose in the morning will not solve the problem of the patient who lacks insulin during the wee hours of the morning. In fact a few diabetics have to have 4 shots or more a day in order to satisfy their peculiar requirements.

c. Once the blood sugar goes down, insulin can be discontinued. When blood sugar goes down, insulin requirements go down, but stopping the insulin more often than not leads to a rebound elevation of the blood sugar.

d. Stop insulin when patient is sick and not eating enough. Again the doctor will most often reduce but not stop insulin in such cases. There are occasions, however, when even if the patient is not eating enough, sickness can remarkably elevate blood sugars. Then in-

sulin must be given in bigger amounts instead of being reduced or stopped.

e. Increasing the dose of insulin or giving an additional dose can cover for excess food intake or for taking of prohibited food. Insulin injection is not a license for non-compliance. Such practices are dangerous and can only lead to wild swings of blood sugars and the setting-in of complications early.

Similarly, an elevated blood sugar need not necessarily lead to an immediate increase in insulin dose.

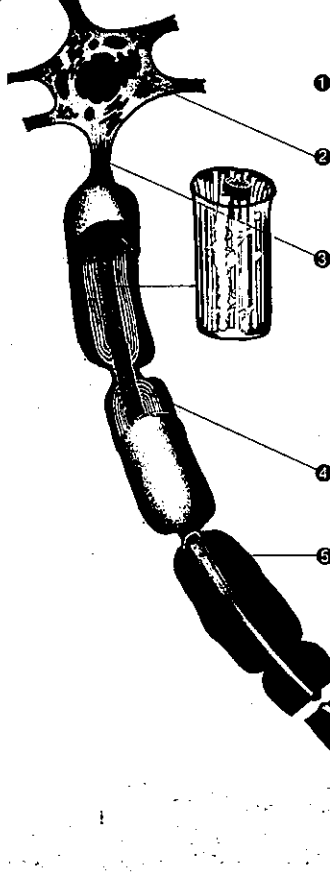
f. Adjusting insulin dose depending solely on urine sugars. This is a very tricky if not altogether dangerous practice that must be replaced by home blood sugar monitoring.

6. Ordinary 1, 2, 5 cc syringes, tuberculin syringes can do for insulin injection. Only insulin syringes are calibrated for insulin use. And syringes must correspond to the strength of the insulin being used. One must always use a U-100 syringe for a U-100 insulin preparation, not a U-40 syringe for a U-100 insulin nor a U-80 syringe for a U-40 insulin. Mathematical conversions are best left to the experts. (REF)

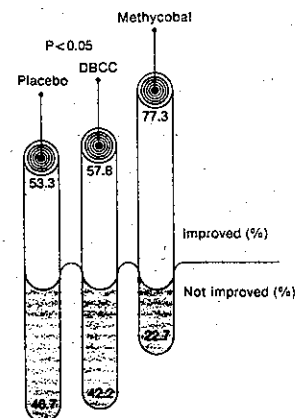
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