August 2009 Newsletter:

PROACT INC. A PHARMACY BENEFITS MANAGEMENT COMPANY

Understanding Diabetes

Inside this issue:

Did you know that over 20 million people in the US have diabetes, and an estimated 2,200 new diabetics are diagnosed each day. Diabetes is a metabolic disorder of fat, protein, and carbohydrate metabolism caused by a defect in insulin secretion, insulin sensitivity, or both, leading to chronic elevations in blood glucose known as hyperglycemia.

Long Term Complications

If untreated, or undertreated, diabetes can lead to retinopathy (eye damage), neuropathy (nerve damage), nephropathy (kidney damage), and cardiovascular disease including an increased risk of stroke.

Types of Diabetes

It is important to remember that not all diabetics are the same as there are various complications that can lead to hyperglycemia. The two most common types of diabetes are Type I and Type II diabetes.

Type I diabetes is an absolute insulin deficiency where your pancreas is unable to produce enough insulin to supply your body's needs. Type I diabetes is thought to be a genetically transmitted autoimmune disorder, that often occurs at a young age and is commonly referred to as Juvenile Onset Diabetes.

Type II diabetes is largely characterized by insulin resistance, and in some cases, like Type I diabetes, insulin deficiency. Type II diabetes typically occurs in adults, is often associated with obesity, and is commonly referred to as Adult Onset Diabetes. It is thought that for every 2 people diagnosed with Type II diabetes, there is another 1 person yet undiagnosed.

Diagnosis

Diagnosis of diabetes is typically made around three main criteria.

- Fasting plasma glucose, or a blood glucose level first thing in the morning before food. Levels >125mg/dL
- Glucose Tolerance Test (75grams) 2 hours post >200mg/dL
- Random plasma glucose>200mg/dL and symptomatic

Results of any of the above must be confirmed through retesting on a separate day

At Risk Populations

While there is thought to be a large genetic component linked to the development of Type I diabetes, Type II diabetes is much more prevalent in individuals who are obese and/or have metabolic syndrome. Metabolic syndrome is a condition characterized by excessive abdominal obesity, as well as elevated fasting glucose, triglycerides, and blood pressure.

Treatment

Treatment of diabetes should start with, and always include lifestyle modifications, focused around diet and exercise.

The goals of therapy in treating diabetes should focus on three main factors; Reducing hyper and hypoglycemic symptoms, delaying or preventing long term complications such as retinopathy, neuropathy, nephropathy, and cardiovascular disease, and improving quality of life.

The goals for treating your diabetes are as easy to remembering as your ABCs:

A$_{1C}$ - Goal: < 6.5%

Blood Pressure—Goal: < 130/80mm/Hg

Cholesterol and **C**irculation—LDL <100mg/dl, HDL >40mg/dl in men and 50mg/dl in women, Trigs <150mg/dl, and an aspirin a day

As you can see, it is important for diabetics to not only worry about their blood sugar but cardiovascular health as a whole.

Diet

The main target of diet in diabetics is to monitor carbohydrate intake. Diabetic patients should follow a low carb diet, rich in fiber and protein. "Carb Counting" is a common method used by diabetics to help track their carbohydrate intake. While there are many methods of tracking your carbohydrates, one easy method is to track "servings" of carbohydrates where one serving is 15grams of total carbohydrates. Women should consume 3-4 servings per meal while men should consume 4-5 servings per meal. Snacks should be limited to 1-2 carbohydrate servings. Each gram of fiber can be subtracted from your total carbohydrate intake, for example. A meal with 60 grams of carbohydrates equates to 4 servings. If that 60 gram meal also contained 30 grams of fiber, this meal would be based only on 30 grams, or 2 servings.

Exercise

A minimum of 150 minutes of moderate exercise (50-70% of max heart rate) a week is recommended for patients with diabetes. This can be reduced down to 90 minutes a week of vigorous activity with a sustained heart rate of >70% of your max heart rate.

Medication Therapy

Medication therapy to treat diabetes has traditionally been administered in one of two ways, oral therapy or subcutaneous insulin injections. While most therapies still fall in these two categories, newer medications are available for subcutaneous injection such as incretin mimetics and amylin analogs. These newer injections are typically used in combination with other therapies, however may be used as monotherapy for some patients.

It is important to remember that medication therapy will differ from patient to patient due to individual needs.

Oral Therapy

Oral medication therapy is typically used only in Type II diabetics. There are multiple medications available that work in a variety of ways. One of the most common medications used in Type II diabetics is Metformin. Metformin helps increase your bodies sensitivity to insulin, and allows you to make more productive use of the insulin that is available. As a lack of insulin sensitivity is an issue in most Type II diabetics, Metformin is recommended for ALL patients with Type II diabetes UNLESS a contraindication to the drug is found such as an allergy, or decreased kidney function.

The remaining oral therapies work through a variety of mechanisms, from inhibiting GI enzyme function, stimulating insulin production (either at baseline or around meal time), and decreasing glucose production in your liver. The medication that you will need will depend on the origin of your elevated glucose levels.

Insulin Therapy

Insulin has traditionally been used for just Type I diabetics, however it is becoming more and more popular in Type II Diabetics as well.

Insulin can be categorized based on the duration of action.

- Rapid Acting—Novolog and Humalog; dosed with meals 3-4 times daily
- Short Acting—Humulin R (Regular); dosed with or around meal times 2-3 times daily
- Intermediate Acting—Humulin N (NPH); 1-2 times daily
- Intermediate-Long Acting—Levemir; 1-2 times daily
- Long Acting—Lantus; 1 time daily

While one type of insulin may be adequate in controlling your blood sugar, it is very common to need two types of insulin in what is commonly referred to as Basal/Bolus dosing. Basal/Bolus dosing is the use of a longer acting insulin such as NPH, Levemir, or Lantus to control your Basal (baseline) blood sugar and to use a shorter acting insulin such as Novolog, Humalog, or Regular with meals to control peaks in blood sugar when you eat. Some insulin products are available in combination of a longer acting and shorter acting insulin to increase ease of use. It is important to check with your doctor or pharmacist before mixing insulin as some should never be mixed.

While subcutaneous injections can be given in the back of your arm and side of your thighs, the preferred method for most is in your abdomen. Subcutaneous abdominal injections have been shown to lead to an increased rate and consistency of absorption. It is important to rotate your injection site throughout whatever area you choose to help prevent scarring.

Additional Therapies

In addition to insulin, other injections have emerged into the marketplace to help control diabetes. One of the most common is Byetta, which helps stimulate insulin secretion as well as help to re-generate the cells in your pancreas that naturally produce insulin. Byetta has a secondary mechanism that slows gastric emptying leading to decreased food intake. This is beneficial in diabetics as it will lead to smaller peaks in blood glucose after a meal due to smaller food intake, and may also be beneficial in helping overweight, diabetic patients lose weight. Symlin is another agent available for subcutaneous injection. Symlin is typically dosed with meals, and can help reduce the amount of insulin needed due to increased gastric emptying and reducing post meal glucose levels.

Self Monitoring

At home monitoring of your blood sugar is a quick, easy, and effective way to help control diabetes. Home monitoring is done using a blood glucose meter where a finger stick (or other location dependent on machine) is performed to acquire a small amount of blood for testing. This sample is then tested with a small hand held meter giving you your blood glucose reading in seconds.

Home monitoring is commonly used as an indicator of how much insulin should be injected for patients receiving insulin therapy. Home monitoring is equally as important for diabetic patients not receiving insulin as it helps make you aware of what foods lead to increases in your blood sugar, as well as gives you an indication of how well controlled you are on your current therapy.

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