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Diabetes Health Center

Oral Diabetes Medications

Oral diabetes medications -- diabetes pills -- help control blood sugar levels in people whose bodies still produce some insulin (the majority of people with type 2 diabetes). These diabetes drugs are usually prescribed to people with type 2 diabetes along with recommendations for making specific dietary changes and getting regular exercise. Several of these drugs are often used in combination to achieve optimal blood sugar control.

Remember that people with type 2 diabetes tend to have two problems that lead to increased sugar (glucose) in the bloodstream:

1. They don't make enough insulin to move glucose into cells where it belongs.
2. The body's cells become "resistant" to insulin (insulin resistance), meaning they don't take in glucose as well as they should.

In time, people with type 2 diabetes develop what's called "beta-cell failure." This means that the cells in the pancreas that make insulin no longer are able to release insulin in response to high blood sugar levels. Therefore, these people often require insulin injections, either in combination with their diabetes pills, or just insulin alone to manage their diabetes.

Assess Yourself: Is Your Type 2 Diabetes Under Control?

Types of Diabetes Pills

Diabetes pills are grouped in categories based on type. There are several categories of diabetes pills -- each works differently.

Sulfonylureas. These diabetes pills lower blood sugar by stimulating the pancreas to release more insulin. The first drugs of this type that were developed -- Dymelor (acetohexamide), Diabinese (chlorpropamide), Orinase (tolbutamide), and Tolinase (tolazamide) -- are not as widely used since they tend to be less potent and shorter-acting drugs than the newer sulfonylureas. They include Glucotrol (glipizide), Glucotrol XL (extended release), DiaBeta (glyburide), Micronase (glyburide), Glynase PresTab (glyburide), and Amaryl (glimepiride). These drugs can cause a decrease in the hemoglobin A1c (HbA1c) of up to 1%-2%.

Biguanides. These diabetes pills improve insulin's ability to move sugar into cells especially into the muscle cells. They also prevent the liver from releasing stored sugar. Biguanides should not be used in people who have kidney damage or heart failure because of the risk of precipitating a severe build up of acid (called lactic acidosis) in these patients. Biguanides can decrease the HbA1c 1%-2%. An example includes metformin (Glucophage, Glucophage XR, Riomet, Fortamet, and Glumetza).

Thiazolidinediones. These diabetes pills improve insulin's effectiveness (improving insulin resistance) in muscle and in fat tissue. They lower the amount of sugar released by the liver and make fat cells more sensitive to the effects of insulin. Actos (pioglitazone) and Avandia (rosiglitazone) are the two drugs of this class. A decrease in the HbA1c of 1%-2% can be seen with this class of oral diabetes medications. These drugs may take a few weeks before they have an effect in lowering blood sugar. They should be used with caution in people with heart failure. In fact, the FDA has restricted Avandia for use in new patients only if they can't control their blood sugar on other medications and are unable to take Actos. Current users can continue Avandia if they choose to do so. All patients using Avandia must review and fully understand the cardiovascular risks.

Alpha-glucosidase inhibitors, including Precose (acarbose) and Glyset (miglitol). These drugs block enzymes that help digest starches, slowing the rise in blood sugar. These diabetes pills may cause diarrhea or gas. They can lower hemoglobin A1c by 0.5%-1%.

Meglitinides, including Prandin (repaglinide) and Starlix (nateglinide). These diabetes medicines lower blood sugar by stimulating the pancreas to release more insulin. The effects of these diabetes pills depend on the level of glucose. They are said to be glucose dependent. High sugars make this class of diabetes medicines release insulin. This is unlike the

sulfonylureas that cause an increase in insulin release, regardless of glucose levels, and can lead to hypoglycemia.

Dipeptidyl peptidase IV (DPP-IV) inhibitors, including Januvia (sitagliptin), Onglyza (saxagliptin), and Tradjenta (linagliptin). The DPP-IV inhibitors work to lower blood sugar in patients with type 2 diabetes by increasing insulin secretion from the pancreas and reducing sugar production. These diabetes pills increase insulin secretion when blood sugars are high. They also signal the liver to stop producing excess amounts of sugar. DPP-IV inhibitors control sugar without causing weight gain. The medication may be taken alone or with other medications such as metformin.

Combination therapy. There are several combination diabetes pills that combine two medications into one tablet. One example of this is Glucovance, which combines glyburide (a sulfonylurea) and metformin. Others include Metaglip, which combines glipizide (a sulfonylurea) and metformin, and Avandamet which utilizes both metformin and rosiglitazone (Avandia) in one pill.

Studies have been done showing that some diabetes pills may help prevent diabetes and diabetes-related complications. Both metformin and Precose have been shown to reduce a person's risk of developing type 2 diabetes, particularly when combined with lifestyle changes such as a proper diet and regular exercise program. Actos has been shown to reduce the risk of heart attack, stroke, and premature death in those with type 2 diabetes. Researchers continue to look into the preventative benefits of other medications.

Side Effects of Oral Diabetes Drugs

Side effects of first- and second-generation sulfonylureas include:

- Hypoglycemia (low blood sugar)
- Upset stomach
- Skin rash or itching
- Weight gain

Side effects for biguanide medications include:

- Upset stomach (nausea, diarrhea)
- Metallic taste in mouth

Side effects for thiazolidinediones are rare but may include:

- Elevated liver enzymes
- Liver failure
- Respiratory infection
- Headache
- Fluid retention

Side effects for alpha-glucosidase inhibitors include:

- Stomach upset (gas, diarrhea, nausea, cramps)

Side effects of meglitinides include:

- Hypoglycemia (low blood sugar)
- Stomach upset

Always take your oral diabetes medicine exactly as prescribed and discuss any specific concerns you might have with your health care provider.

WebMD Medical Reference

SOURCES:
News release, FDA.
PDR.net. American Heart Association.
WebMD Health News: "FDA Restricts Use of Diabetes Drug Avandia."

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My Notes: