

Glyburide and Glipizide (2nd Generation Sulfonylureas)

Glyburide and glipizide are second generation sulfonylureas that stimulate the release of insulin from pancreatic islet cells. This action increases the amount of circulating insulin to maintain normal blood glucose levels in the body. These drugs are indicated for patients with type 2 diabetes who have the ability to produce insulin (refer to Picmonic "Insulin"). Second generation sulfonylureas have replaced first-generation agents due to their increased potency and fewer drug-drug interactions. Hypoglycemia is a major side effect. These drugs should not be used while consuming alcohol and 2nd generation sulfonylureas (except glyburide) should not be used while breastfeeding. Note: Studies have shown glyburide detected in breastmilk of women and while not contraindicated, should still be used with caution.



PLAY PICMONIC

Mechanisms

2nd Generation Sulfonylureas

(2) Tutu Sulfur-funnel-U-rainbow

Second generation sulfonylureas have largely replaced the first generation agents based on their increased potency and fewer drug-drug interactions. The prescribed dosages of these drugs are much lower than first generation agents due to their increased potency.

Blocks Potassium Channels in Beta Cells

Blocks at Banana Channel and Beta-fish

Second generation sulfonylureas stimulate pancreatic islet cells to release insulin. These drugs depolarize the cell membrane by blocking ATP-sensitive potassium channels. As the membrane depolarizes, an influx of calcium enters and drives insulin out of the cells.

Stimulate Release of Insulin

Releasing Insect-syringes

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Indications

Type 2 Diabetes

Dyed-bead-pancreas in (2) Tutu

Second generation sulfonylureas stimulate the pancreatic islet cells to increase insulin release. These drugs are indicated for patients with type 2 diabetes with some pancreatic function. Patients with type 1 diabetes lack the ability to produce insulin and do not benefit from these drugs. Glyburide and glipizide may be used alone or in conjunction with other drug therapy. However, these medications should not replace proper diet and exercise for optimal glucose management.

Side Effects

Hypoglycemia

Hippo-glue-bottle

Since second generation sulfonylureas cause increased insulin release, the patient may develop hypoglycemia (refer to Picmonic "Hypoglycemia Assessment"). Because these medications are processed by the liver and kidneys, patients with hepatic or renal dysfunction are more susceptible to hypoglycemia.

Considerations

More Potent

More Pots

Second generation sulfonylureas are much more potent than first generation agents. Due to their increased potency, lower dosages are needed to elicit the same therapeutic effects. Decreasing the medication dose also decreases risk of side effects.

Beta Blockers Reduce Effects

Beta-fish with Blocks and Down-arrow Effects

Avoid the use of beta blockers while taking second generation sulfonylureas because of their ability to mask sympathetic responses related to decreasing glucose levels. If the patient does not have noticeable symptoms, they may not be able to prevent severe hypoglycemia. Beta blockers also decrease the effect of sulfonylureas by suppressing the release of insulin.

Avoid Alcohol

Avoid-sign Alcoholic-martini

Instruct the patient to abstain from alcohol while taking second generation sulfonylureas. Although disulfiram-like reactions occur more often with first generation sulfonylureas, they should be monitored for with second generation medications. Alcohol potentiates the hypoglycemic effects of the sulfonylurea medications.

Avoid Breastfeeding

Avoid-sign Breastfeeding

Second generation sulfonylureas (except glyburide) should be avoided while pregnant or breastfeeding. Exposure to these drugs prior to delivery causes severe hypoglycemia in newborns lasting up to 10 days. These medications are excreted into breast milk and lead to hypoglycemia in the infant. Insulin may be substituted to control type 2 diabetes in patients who are pregnant or nursing. It is important to note that breastfeeding women should be counseled on the use of breastfeeding and risk of hypoglycemia if continuing the use of glyburide.