Pioglitazone (Thiazolidinediones)

Pioglitazone stimulates receptors in the body to increase cellular response to insulin, thus decreasing insulin resistance. This medication is only effective in the presence of insulin and can only be used in patients with type II diabetes. Side effects of pioglitazone include upper respiratory infection, muscle pain, sinusitis, headache, and heart failure. Patients taking pioglitazone are at increased risk for bladder cancer, and women taking this medication are more prone to bone fractures. Liver enzymes should be routinely monitored while taking pioglitazone due to the risk of liver toxicity.



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-glitazones Suffix
Glitter-zone
Drugs classified as thiazolidinediones can be recognized by the ending “-glitazone.” They are also referred to as TZDs.

Mechanism

Binds PPAR-Gamma
Binding Pepper-Grandma
Thiazolidinediones act by binding and stimulating peroxisome proliferator-activated receptor gamma (PPAR gamma), a nuclear cell transcription regulator that increases cellular response to insulin, especially in peripheral tissues. This action, in turn, decreases insulin resistance in patients with type II diabetes.

Decreases Insulin Resistance
Down-arrow Insect-syringe Resistance swatter
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Indications

Type 2 Diabetes
Dyed-bead-pancreas in (2) Tutu
Pioglitazone is only effective in the presence of insulin and can only be used in patients with type II diabetes. In patients with type II diabetes, this medication increases uptake of glucose by skeletal muscle and fat cells, thus lowering blood sugar.

Side Effects

Weight Gain
Up-arrow Scale
This medication classically causes an unwanted weight gain side effect in many patients.

Heart Failure
Dead Heart
Pioglitazone can lead to fluid retention, increasing a patient’s risk of developing heart failure. Patients should be educated about the signs and symptoms of heart failure, such as difficulty breathing, edema, weight gain, and fatigue. Patients with mild heart failure should use pioglitazone with caution, while those with severe heart failure should not take this medication.

Myalgia
Mayo-algae
Myalgia, or muscle pain can occur when taking this medication.

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Hypoglycemia

Hippo-glue-bottle

Pioglitazone actually has a lower risk than other diabetes medications for developing hypoglycemia. However, when combined with other diabetes medications, the risk of hypoglycemia exponentially increases with this drug class, especially in patients receiving insulin therapy. Signs and symptoms of hypoglycemia include nausea, tachycardia, cold, clammy skin, sweating, tremors, and muscle weakness.

Upper Respiratory Infection

Upper Respiratory Tract Bacteria

Patients taking pioglitazone may develop an upper respiratory infection, sinusitis, or headache. Signs and symptoms of a URI include runny or stuffy nose, sneezing, sore throat, and a cough.

Considerations

Increased Risk of Bladder Cancer

Up-arrow Risk from Bladder Tumor-guy

Long-term use of pioglitazone can increase the risk of developing bladder cancer, especially if the patients was on a high dose. If patients experience pain when urinating or if they notice blood in their urine, they should contact their healthcare provider immediately. Patients with a history of bladder cancer should not take this medication.

Increased Fracture Risk in Women

Up-arrow Risk of Fractured Woman

Long-term use of pioglitazone has also been shown to increase the risk of bone fractures in women. Women taking this medication should participate in regular weight-bearing exercise and ensure adequate intake of calcium and vitamin D to prevent fractures.

Monitor Liver Enzymes

Monitor with Liver Enzymes

The drug troglitazone, also a thiazolidinedione, was taken off the market due to hepatotoxicity, thus, there is concern about liver toxicity in those taking pioglitazone. Patients taking pioglitazone should monitor their liver function by having their AST and ALT levels evaluated every 3 to 6 months. Signs and symptoms of injury to the liver include nausea, vomiting, loss of appetite, yellowing of the skin, and dark urine. The patient should be taught to contact their healthcare provider, if these symptoms develop.

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