



Mechanisms of Metformin in Type 2 Diabetes and Polycystic Ovary Syndrome

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DESCRIPTION

Metformin is a medicine used to treat type 2 diabetes and polycystic ovary syndrome. It works by lowering the amount of glucose in the blood and improving insulin sensitivity. It is taken by mouth and has some common side effects such as nausea, diarrhea, and abdominal pain. It is generally safe for people with mild to moderate kidney disease, as long as the dose is adjusted according to the kidney function. However, metformin can cause a rare but serious condition called lactic acidosis, which is more likely to occur in people with severe kidney disease or other risk factors.

Some of the benefits of taking metformin are:

- It can lower the risk of cardiovascular disease and death in people with type 2 diabetes.
- It can help prevent or delay the onset of type 2 diabetes in people with prediabetes.
- It can help control blood sugar during pregnancy in women with gestational diabetes.
- It can help with menstrual regulation, fertility, and blood sugar in women with Polycystic Ovary Syndrome (PCOS).
- It may lower the risk of some cancers, such as breast, colon, and prostate cancer, especially in people with type 2 diabetes.
- It may lower the risk of dementia and stroke, and slow down cognitive decline.
- It may slow down aging, prevent age-related diseases, and increase lifespan.

Metformin is successful for diabetes as it lowers high blood sugar levels and reduces the risk of complications and death from cardiovascular disease. It prevents or delays the onset of diabetes in people with prediabetes or high risk of developing diabetes. It reduces the incidence of diabetes by 31% compared to placebo in a large randomized trial. Therefore, metformin should be avoided or discontinued in people with an Estimated Glomerular Filtration Rate (eGFR) below 30 mL/min/1.73m² or during acute kidney injury.

Metformin reduces blood sugar levels by inhibiting the glucose production in liver. It used for the Improvement of insulin

sensitivity in body tissues and decreasing in glucose absorption is seen in intestines. Metformin does not lower blood sugar levels instantly like insulin injections. It may take a few weeks or months for a doctor to be able to tell whether metformin is working. However, some studies suggest that metformin can have an acute effect on blood glucose levels by inhibiting intestinal glucose transport, which slows down the intestinal transit of glucose and reduces its absorption into the blood.

Metformin is usually the first-line medication for type 2 diabetes and may be used alone or in combination with other drugs. It is also sometimes used for prediabetes or gestational diabetes. Metformin does not cure diabetes but helps control blood sugar levels by lowering glucose production in the liver, improving insulin sensitivity, and decreasing glucose absorption from the intestines. Metformin may take a few weeks or months to show its full effect on blood sugar levels.

It is important to follow the doctor's instructions on how to take metformin, monitor blood sugar regularly, and adjust the dose as needed. Metformin is generally safe and effective for most people with diabetes, but it may have some side effects or interactions with other medications. It may also cause a rare but serious condition called lactic acidosis, especially in people with kidney or liver problems, heart failure, alcohol abuse, or severe infections. Therefore, metformin should be used with caution and under medical supervision.

CONCLUSION

If metformin alone does not achieve adequate blood sugar control, other medications can be added or substituted. There are several classes of drugs that work in different ways to lower blood sugar levels. Some of them may also have specific advantages for preventing or treating diabetes complications, such as heart disease, kidney disease, or nerve damage. However, they may also have some side effects or interactions with other medications. The choice of medication should be based on a shared decision-making process between the patient and the health care provider, taking into account factors such as blood sugar levels, A1c goals, and risk of hypoglycemia, weight changes,

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cost, convenience, and personal preferences. The medication regimen should be individualized and adjusted over time according to the patient's response and needs.