

IN THE NAME OF GOD

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Article Title:

The Role of metformin in the management of type 2 diabetes: recent advances

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Study Population:

patient with type 2 diabetes mellitus.

Study Objective:

to review the mechanism of action, benefits and evolving role of metformin in the management of type 2 diabetes.

Inclusion Criteria:

overweight patients (>120% ideal body weight) with newly diagnosed type 2 diabetes.

Variables:

Glycemic control

Hypoglycemic episode

Microvascular complication

Macrovascular complication

Weight Loss

- **Methodology**

The excerpt describes two key studies:

- **1**. UKPDS 33: A randomized controlled trial that compared intensive blood glucose control using sulfonylurea or insulin vs. conventional therapy with diet in 3,867 patients with newly diagnosed type 2 diabetes.
- **2**. UKPDS 34: A randomized controlled trial that evaluated the effects of intensive glucose control with metformin vs. conventional therapy in 753 overweight patients with newly diagnosed type 2 diabetes.

Abstract

The management of type 2 diabetes has evolved significantly in recent years, with metformin remaining a cornerstone of treatment but facing competition from newer antidiabetic agents. This review examines the key aspects of metformin's role in type 2 diabetes management.

Introduction

Metformin has been the cornerstone of type 2 diabetes mellitus (T2DM) management for decades. The drug is derived from *Galega officinalis*, otherwise known as the French lilac, and was first found to have glucose-lowering activity in 1918. It belongs to the class of drugs called biguanides.

Mechanism of Action

Metformin has multiple reported mechanisms of action in different tissues. It inhibits hepatic gluconeogenesis, increases insulin-related glucose uptake in muscles, and increases glucose uptake and utilization in intestinal tissue. Metformin has also been linked to weight loss and appetite suppression by modulating serum growth differentiating factor-15 in mouse models and hypothalamic appetite-regulatory centers in healthy individuals.

Clinical Evidence

Here is the summary of the key studies discussed in the article, in English:

A-The UKPDS 33 study

- This study was conducted on 3,867 newly diagnosed patients with type 2 diabetes.
- Patients were divided into two groups: conventional treatment (diet) and intensive treatment (antidiabetic drugs).
- The results showed that intensive treatment led to a 12% reduction in the risk of any diabetes-related endpoint, a 10% reduction in the risk of diabetes-related death, and a 6% reduction in all-cause mortality.
- However, the intensive treatment group experienced a higher number of hypoglycemic episodes.

B-The UKPDS 34 study

- This study was conducted on 753 overweight patients with newly diagnosed type 2 diabetes.
- Patients were divided into two groups: conventional treatment (mostly diet) and intensive treatment with metformin.
- The results showed that treatment with metformin led to a 32% reduction in the risk of any diabetes-related endpoint, a 42% reduction in the risk of diabetes-related death, and a 36% reduction in all-cause mortality.

In summary, these studies demonstrate that metformin plays an important role in blood glucose control and the reduction of micro- and macro-vascular complications of type 2 diabetes.

Current Guidelines and Role of Metformin

Metformin has been the cornerstone of type 2 diabetes management for decades and is still recommended as the first-line therapy. However, the emergence of newer agents like SGLT-2 inhibitors and GLP-1 receptor agonists, which have demonstrated significant positive effects on glycemia and added benefits in patients with obesity, renal disease, heart failure, and cardiovascular disease, has prompted a re-evaluation of metformin's role as the initial therapy for all patients with diabetes.

Conclusion

Metformin remains an important and effective drug in the management of type 2 diabetes, but its position as a universal first-line treatment has been somewhat challenged by the emergence of newer and more comprehensive antidiabetic medications.

Thanks For Listening