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Review Article

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IN A STUDY ON TYPE 1 DIABETES MELLITUS TREATED WITH METFORMIN

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ABSTRACT

Metformin is a biguanide anti-hyperglycemic agent used for treating non-insulin dependent diabetes mellitus (NIDDM) It improves glycemic control by decreasing hepatic glucose production, decreasing glucose absorption and increasing insulin-mediated glucose uptake. Metformin may induce weight loss and is the drug of choice for obese NIDDM patients. Retrospective study suggest that use of metformin in patients with type DM reduces glucose concentration, and decreases metabolic syndrome prevalence. Addition of metformin to insulin therapy promote weight control, and reduce insulin dose requirements in patients with type 1 diabetes has been assessed in systematic reviews.

KEYWORDS: Metformin; Diabetes type1, Glycemic control.

INTRODUCTION

Diabetes mellitus is the most common of the endocrine disorder. It is a chronic condition characterized by hyperglycemia and due to impaired insulin secretion with or without insulin resistance. More than 2.6 millions people in the UK have diabetes, and by the year 2025, this number is estimated to rise to 4 millions. The concept of adjunct therapy for type 1 diabetes has emerged in response to these challenges and is based on the notion that: (1) adding a simple (oral) preparation to insulin therapy might help to improve glycaemic control; and (2) such additional therapeutic agents might have effects independent of glucose lowering to reduce the risk of diabetes complications. The ideal adjunct therapy would, therefore, reduce insulin dose requirement, lower HbA_{1c} without increasing the risk of hypoglycaemia, reduce weight, and have direct effects to reduce the risk of cardiovascular disease and improve life expectancy

Classification of Diabetes Melitus

Diabetes mellitus may be classified according to etiology, by far the most common types being type-1 and type-2 diabetes.

Type-1 Diabetes

Type-1 diabetes is a disease characterized by the destruction of the insulin-producing pancreatic β cells, the development of which is either autoimmune T-cell mediated destruction (type 1A) or idiopathic (type1B).

In over 90% of cases, β-cell destruction is associated with autoimmune disease. Type-1 diabetes usually develops in younger (below the age 30 years, although it can develop at any age and is usually associated with a faster onset of symptoms leading to dependency on extrinsic insulin for survival.

Type-2 Diabets

Type-2 diabetes is more common above the age of 40, with a peak age of onset in development countries between 60 and70 years. The prevalence of type-2diabetes varies widely in different populations being 6 time more common in those South Africa compare with those of Northern European origin.

It is caused by a relative insulin deficiency and insulin resistance. Symptoms are generally slower in onset and less marked than those of type-1. Type-2 diabetes may be an incidental findings, particularly when patients present with complications associated with the disease.

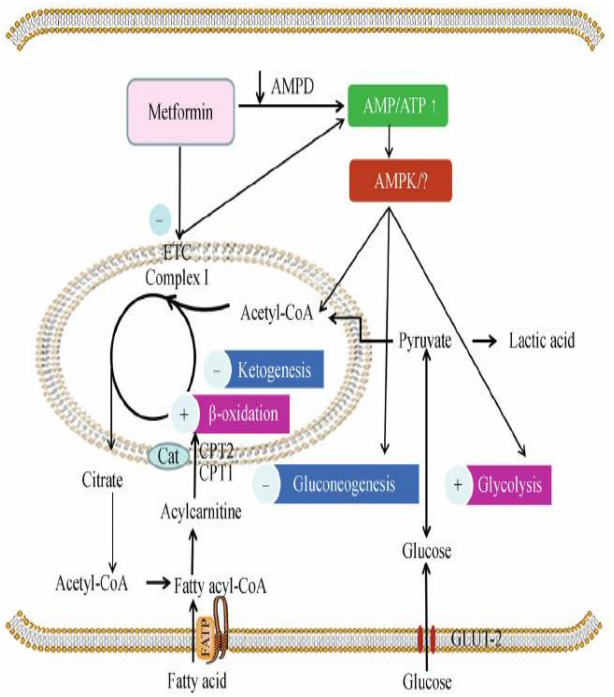
Gestational Diabetes

Gestational diabetes is a condition in which women first exhibit elevated levels of plasma glucose during pregnancy.

Metformin

- Metformin is a biguanide antihyperglycemic agent used for treating non-insulin dependent diabetes mellitus (NIDDM)
- It improves glycemic control by decreasing hepatic glucose production, decreasing glucose absorption and increasing insulin-mediated glucose uptake. Metformin may induce weight loss and is the drug of choice for obese NIDDM patients

- Use of metformin is associated with modest weight loss. When used alone, metformin does not cause hypoglycemia
- Its main side effects are dyspepsia, nausea and diarrhea.
- Metformin should be avoided in those with severely compromised renal function, severe liver disease and for 48 hours after the use of iodinated contrast dyes due to the risk of lactic acidosis
- Metformin decreases blood glucose levels by decreasing hepatic glucose production decreasing intestinal absorption of glucose, and improving insulin sensitivity by increasing peripheral glucose uptake and utilization.



Metformin in Type1 Dm

The addition of off-label metformin to insulin therapy to improve insulin sensitivity, promote weight control, and reduce insulin dose requirements in patients with type 1 diabetes has been assessed in systematic reviews. Retrospective study suggest that use of metformin in patients with type DM reduces glucose concentration, and decreases metabolic syndrome prevalence. Previous studies have reported that metformin improves blood lipid profile. Some studies have suggested that addition of metformin in insulin therapy reduces insulin dose requirement.

In adolescents with T1DM addition of metformin to insulin therapy is associated with improved of HbA1c levels.

CONCLUSION

Addition of metformin to insulin therapy promote weight control, and reduce insulin dose requirements in patients with type 1 diabetes has been assessed in systematic reviews. The present study suggests that metformin decreased glucose concentrations, lowered metabolic syndrome prevalence, as well as insulin dose requirement, more than insulin alone. These effects were independent of blood lipid improvement or weight loss, although on average weight remained decreased with metformin and insulin therapy, whereas the average weight increased with insulin therapy alone. Larger placebo-controlled studies are needed to determine the long-term effects of metformin-adjunctive therapy on poorly controlled type 1 diabetes. Metformin decreased glucose concentrations, reduced metabolic syndrome, as well as insulin dose requirement more than insulin therapy alone, 1 year after treatment. There is some evidence suggesting improvements of metabolic control in poorly controlled adolescents with type-1 diabetes, on addition of metformin to insulin therapy. Stronger evidence is required from larger studies, carried out over longer time periods to document the long term effects on metabolic control, health-related quality of life as well as morbidity and mortality in those patients.

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