



# **Unintentional Weight Loss from Metformin Despite Good Glycaemic Control in a Newly Diagnosed Diabetic Patient**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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**Case Report**

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## ABSTRACT

**Aim:** To present a case of unintentional weight loss from Metformin despite good glycaemic control in a newly diagnosed diabetic patient.

**Case Presentation:** A 60-year-old previously diagnosed hypertensive and recently diagnosed type 2 diabetic patient with good glycaemic and blood pressure control presented with progressive weight loss in the last one year while on medication. Her normal state weight was 84.6kg, height 1.70m<sup>2</sup> (BMI 29.27kg/m<sup>2</sup>) which dropped to 70kg (BMI 20.26Kg/mg<sup>2</sup>) at the point she was diagnosed with type 2 diabetes mellitus (T2DM). She was counselled about dietary and lifestyle modification. She was then commenced on Metformin and she achieved a good blood glucose level control but her weight dropped further to 58kg despite adherence with diet and lifestyle. She was then changed to Sulphonylurea (Glipizide). She had a significant improvement in her weight which she had maintained with good glycaemic control.

**Discussion:** Oral hypoglycemic agents (OHAs) are the most common initial pharmacologic treatments for type 2 diabetes and they are associated with changes in weight. Sulphonylureas (SUs) are widely used in routine clinical practice, not only in combination with metformin, but also as first-line monotherapy. Patients often gain weight due to the side effects of current therapies, particularly SU, insulin and glitazone therapies.

**Conclusion:** It is important for clinicians to consider not only the antihyperglycemia effects of selected medications used in the treatment of diabetes, but also the effect they may have on the patient's body weight.

*Keywords: Diabetes; metformin; weight loss; body mass index.*

## 1. INTRODUCTION

“Diabetes Mellitus (DM) is a non-communicable disease of public health concern which affects about one in eleven adults worldwide and this is projected to increase to one in ten by 2040” [1]. “Hyperglycemia can cause a variety of symptoms, such as polydipsia, polyphagia, polyuria, blurred vision, weight loss, generalized pruritus, neuropathy, retinopathy, etc.” [2]. Unintentional weight loss is said to occur when there is more than 5% reduction in body weight within 6 to 12 months [3]. For patients with type 2 diabetes mellitus (T2DM), the prevention of weight gain and modest weight loss of even 5% can considerably lower cardiovascular risk factors and the complications linked with diabetes [4]. “The link between excess weight and T2DM is very strong, with studies confirming that the vast majority of patients are overweight or obese, and that obese people are at the highest risk of developing T2DM” [5].

## 2. CASE REPORT

A 60-year-old previously diagnosed hypertensive and recently diagnosed diabetic patient presented to the clinic with progressive weight loss despite a good glycaemic and blood pressure control. She had been hypertensive for

a year and stable on daily dose of Amlodipine 5mg and Hydrochlorothiazide 25mg. She had evidences of weight loss such as looseness of her clothes, prominent malar bone and clavicular bones over 14 months. This had become so obvious that most of her associates and family members had shown concern that she had lost so much weight. There was no history of change in diet or lifestyle. Her weight pre diagnosis was 84.6kg and height was 1.70m<sup>2</sup> putting her BMI at 29.27kg/m<sup>2</sup>. At diagnosis, her weight was 70kg (BMI 24.22Kg/m<sup>2</sup>). She was counselled about dietary and lifestyle modification. Also, Metformin 1g twice daily was commenced then and antihypertensive medications were maintained. Subsequently, she had regular clinic visits and adherence to medication was good but her weight continues to drop to 58kg BMI (20.26Kg/m<sup>2</sup>). Her fasting glucose level ranged between 54 to 122mg/dl. At this point, her HBA1c level was 6.3% with laboratory reference range of 6.0 to 6.8%. Metformin was discontinued and was placed on Glipizide 5 mg daily after ruling out contraindications to its use which includes renal and hepatic diseases. The major side effect of the medication which is hypoglycaemia was also discussed with the patient. With this, the lost weight was regained within 4 months, and she now maintained her weight of 70kg (BMI 24.22Kg/m<sup>2</sup>) while glycaemic control remained very good.



**Fig. 1. Image before changing medication**



**Fig. 2. Image after changing medication**

### 3. DISCUSSION

“Diabetes is associated with a number of potentially modifiable risk factors, such as insulin resistance, obesity, physical inactivity, and dietary factors” [6]. “Therefore, management of type 2 diabetes often includes lifestyle modification and pharmacologic therapy” [7]. The American Dietetic Association also emphasizes that foods are best for maintaining euglycemic status if consumed in moderation with appropriate portion sizes and regular physical activity [8]. “The patient presented above maintained her physical activity and complied with dietary and lifestyle modification as counselled earlier. The most common first-line medications for type 2 diabetes are oral hypoglycemic agents (OHAs), which are linked to changes in weight. The most popular choices for initial treatment are sulfonylureas or metformin. Metformin is typically associated with weight loss of 1-2 kg over the first year. The other agents are associated with a weight gain over the first year (approximately 1.5 kg for sulfonylureas and 1.5-2.5 kg for thiazolidinediones)” [9].

“The American Association of Clinical Endocrinologists and the American College of Endocrinology (AAACE/ACE) and the American Diabetes Association/European Association for the Study of Diabetes (ADA/EASD) currently recommend the early initiation of metformin as a first-line medication for monotherapy and combination therapy for patients with T2DM. This suggestion is mostly based on metformin's ability to decrease blood glucose, its affordability, and its generally mild side effects, which do not include weight gain” [10].

In general clinical practice, sulphonylureas (SUs) are frequently used, not just in combination with metformin but also as first-line monotherapy [11]. “Every agent has some risk, primarily in the form of an unfavorable effect profile, as well as benefit, based on effects on glycaemic control and potential pleiotropic effects” [12].

“Hypoglycemia is the major side effect of all sulfonylureas, while minor side effects such as headache, dizziness, nausea, hypersensitivity reactions, and weight gain are also common. Sulfonylureas are contraindicated in people with hepatic and renal disorders, as well as in those who are pregnant. Also, patients who take beta-adrenergic antagonists to treat their hypertension may not be aware that they have hypoglycemia” [13].

“Due to the side effects of current therapies, especially SU, insulin, and glitazone therapies, patients frequently gain weight. Also, frequent intake of food between regular meals to avoid hypoglycaemic events increases the potential for significant weight gain in a population of patients who are already at an increased risk from cardiovascular morbidity and mortality” [14]. The patient presented above had no contraindication to the use of SU and she was counselled about the major side effects of the medication. Similarly, the need continue with dietary and lifestyle modification with medication adherence was emphasized to her.

It is important that clinicians consider not only the antihyperglycaemia effects of selected medications, but also the effect they may have on body weight [4]. Managing weight at the same time as achieving glycaemic control is a major challenge for physicians treating T2DM patients [15].

### 4. CONCLUSION

Weight management and achieving good glycaemic control is a major challenge in treating patients with T2DM. Therefore, Clinicians should not only consider the antihyperglycaemic effects of selected medications but also the effect they may have on the weight of the patients.

### CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

### ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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