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Research Paper

Predictors of Metformin Side Effects in Patients with Newly Diagnosed Type 2 Diabetes Mellitus

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Abstract

Introduction Metformin has become the first-line agent for the treatment of type 2 diabetes mellitus (T2DM) in several international guidelines. Up to 25% of patients suffer from gastrointestinal side-effects, with approximately 5% unable to tolerate metformin at all.

Objective We aimed to study the effect of variables that may influence the development of metformin side effects and/or intolerance.

Method A prospective study was conducted from April 1, 2021 to March 30, 2022. One-hundred and forty-eight patients newly diagnosed with T2DM were enrolled in the study, and divided into two groups—those who were escalate to the maximum dose of metformin over 2 weeks ($n = 43$) and the other group over 4 weeks ($n = 105$). We studied the variables that may affect the development of side effects including age, gender, body mass index (BMI), lipid profile, glycemic level, and the use of other antidiabetic medications besides the duration of dose escalation.

Results Total number of patients who developed side effects was 59 (39.9%). Twenty-four (55.8%) and 35 (33.3%) patients were put in the rapid and slow escalation groups, respectively. Twenty-six (17.6%) patients developed diarrhea that was the most common side effect. Two (2.7%) men and ten women (13.5%) had stopped metformin due to severe side effects developed after initiation ($p = 0.016$). The mean BMI for the patients who discontinued metformin was 34.7 ± 4.1 kg/m^2 in the rapid escalation arm and 31.6 ± 3.3 kg/m^2 in the slow escalation arm ($p = 0.003$). The mean of fasting blood glucose for the patients who discontinued metformin in the rapid and slow escalation arms was 200.6 ± 25.6 and 173.4 ± 36.5 mg/dL, respectively ($p = 0.022$).

Conclusion The severity of metformin side effects is higher in women than in men, making more women to discontinue the drug. Besides, a higher fasting blood sugar and BMI are associated with a higher rate of discontinuation. A rapid dose escalation is associated with a higher frequency of side effects. Diarrhea is the commonest side effect encountered.

Keywords
- diabetes mellitus
- metformin
- side effects
- intolerance
- dose escalation

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