





Article

Evaluating the Influence of Mood and Stress on Glycemic Variability in People with T1DM Using Glucose Monitoring Sensors and Pools

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Citation: Velasco, J.M.; Botella-Serrano, M.; Sánchez-Sánchez, A.; Aramendi, A.; Martínez, R.; Maqueda, E.; Garnica, O.; Contador, S.; Lanchares, J.; Hidalgo, J.I. Evaluating the Influence of Mood and Stress on Glycemic Variability in People with T1DM Using Glucose Monitoring Sensors and Pools. *Diabetology* **2022**, *3*, 268–275. <https://doi.org/10.3390/diabetology3020018>

Academic Editor: Naoaki Sakata

Received: 11 March 2022

Accepted: 6 April 2022

Published: 11 April 2022

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Abstract: Objective: Assess in a sample of people with type 1 diabetes mellitus whether mood and stress influence blood glucose levels and variability. **Material and Methods:** Continuous glucose monitoring was performed on 10 patients with type 1 diabetes mellitus, where interstitial glucose values were recorded every 15 min. A daily survey was conducted through Google Forms, collecting information on mood and stress. The day was divided into six slots of 4-h each, asking the patient to assess each slot in relation to mood (sad, normal or happy) and stress (calm, normal or nervous). Different measures of glycemic control (arithmetic mean and percentage of time below/above the target range) and variability (standard deviation, percentage coefficient of variation, mean amplitude of glycemic excursions and mean of daily differences) were calculated to relate the mood and stress perceived by patients with blood glucose levels and glycemic variability. A hypothesis test was carried out to quantitatively compare the data groups of the different measures using the Student's *t*-test. **Results:** Statistically significant differences (p -value < 0.05) were found between different levels of stress. In general, average glucose and variability decrease when the patient is calm. There are statistically significant differences (p -value < 0.05) between different levels of mood. Variability increases when the mood changes from sad to happy. However, the patient's average glucose decreases as the mood improves. **Conclusions:** Variations in mood and stress significantly influence blood glucose levels, and glycemic variability in the patients analyzed with type 1 diabetes mellitus. Therefore, they are factors to consider for improving glycemic control. The mean of daily differences does not seem to be a good indicator for variability.

Keywords: glucose variability; stress; mood; Continuous Glucose Monitoring; glycemic control

1. Background

The prevalence of depression and psycho social stress is higher in people with Type 1 Diabetes Mellitus (T1DM) [1]. The presence of emotional disorders has been associated with poorer long-term glycemic control [2]. The impact of daily mood swings and stress on short-term glycemic control and glycemic variability has been little studied, and to date no study with Continuous Glucose Monitoring (CGM) has been reported. High glycemic variability increases the risk of hypoglycemia, hinders metabolic control, and may be associated with an increase in chronic complications.