Quality of life versus glycaemic variability and time in range in people with type 1 diabetes: sub study of the RESCUE-trial

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Abstract:

Background and aims: Living with type 1 diabetes (T1D) is challenging. Strict glucose control is necessary to avoid hypo- and hyperglycaemic spells. The advent of continuous glucose monitoring (CGM) has changed the way T1D is managed, enabling us to document glucose control 24 hours a day, and providing us with information on glucose variability and percentages of time spent in range (TIR: 70-180 mg/dL), below (TBR) or above (TAR) this range. Whether parameters of glycaemic variability such as standard deviation [SD] and coefficient of variation [%CV], and TIR would affect quality of life has not been studied in detail before.

Materials and methods: Between September 2014 and January 2017, 515 adults with T1D entered the Belgian reimbursement system for real-time CGM (RT-CGM). The following questionnaires were completed at start, after 12 months and after 24 months: Health-related quality of life questionnaire (SF-36 version 2), five item short-form of the Problem Areas In Diabetes (PAID-SF) questionnaire, and the worry subscale of the Hypoglycemia Fear Survey (HFS, version 2). The correlation between the questionnaire scores at start and glucometrics derived from the first 2 weeks of RT-CGM use after start of full reimbursement was investigated. Multiple linear regression analysis was used to assess independent risk factors related to quality of life parameters. In each model, age, diabetes duration, BMI, gender, HbA1c, and the parameters of interest in this study (SD, %CV, and TIR) were included as independent risk factors.

Results: Shorter TIR was independently correlated with more limitations due to physical problems (B=0.392; P=0.008), more limitations due to emotional problems (B=0.274; P=0.017), and lower vitality (B=0.283; P=0.006). Also, shorter TIR was independently correlated with more diabetes-related emotional distress (B=-0.063; P=0.002). In none of these models, age, diabetes duration, HbA1c, or parameters of glucose variability proved to be independently associated with quality of life measures.

Conclusion: A longer TIR was found to be correlated with a better quality of life, but surprisingly SD and %CV did not have any influence.