POSSIBILITIES OF GLUCOCARDIOMONITORING IN PATIENTS WITH TYPE 2 DIABETES MELLITUS

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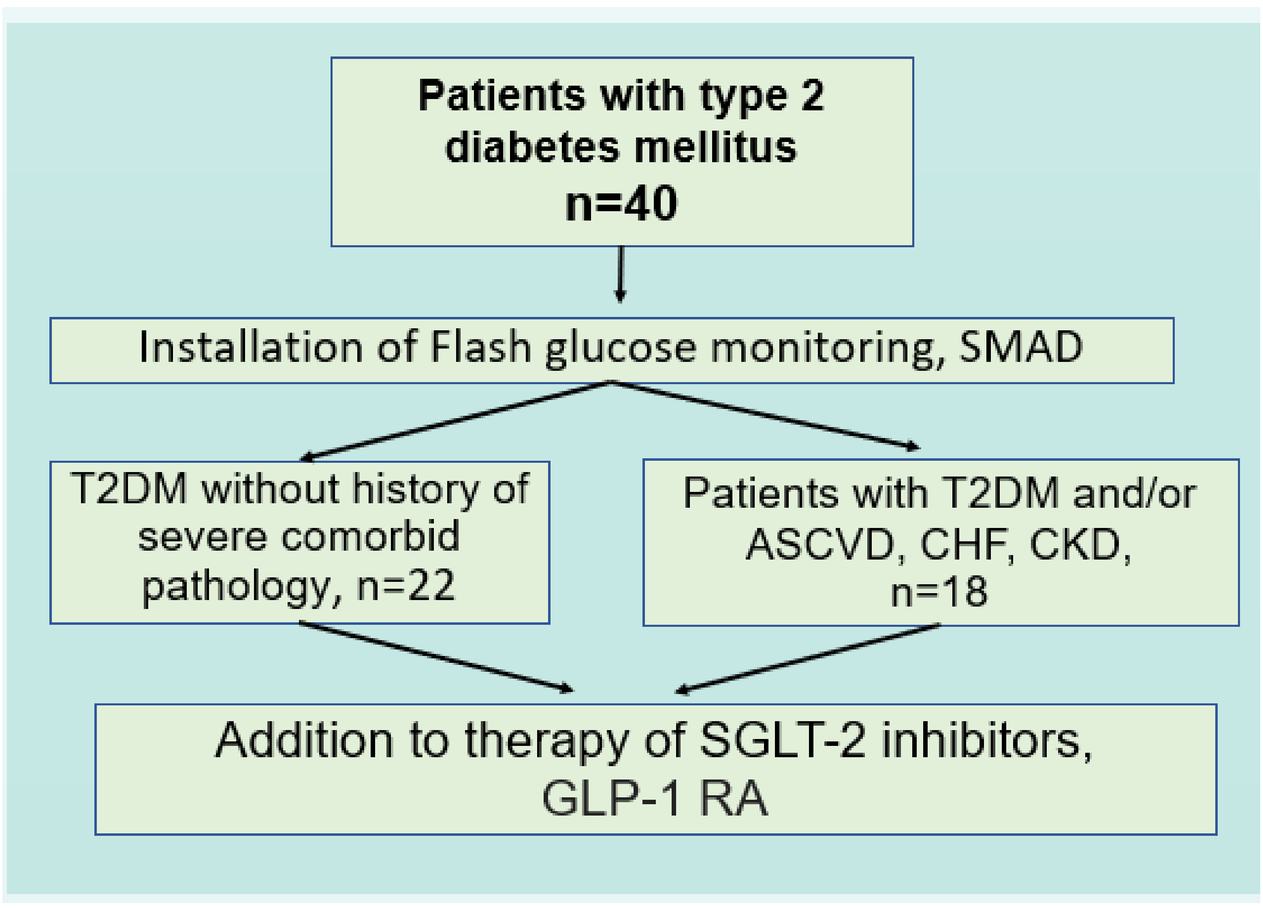
INTRODUCTION

Hyperglycemia, glycemic variability (GV), high blood pressure and heart rate are prognostically unfavorable factors that aggravate both diabetes and associated comorbidities, in particular atherosclerotic cardiovascular diseases (ASCVD), chronic heart failure (CHF) and chronic kidney disease (CKD).

The aim: to study the relationship between daily glucose, blood pressure and heart rate in comorbid patients with type 2 diabetes, as well as to evaluate the impact of innovative glucose-lowering drugs (GLD) on GV.

MATERIALS AND METHODS

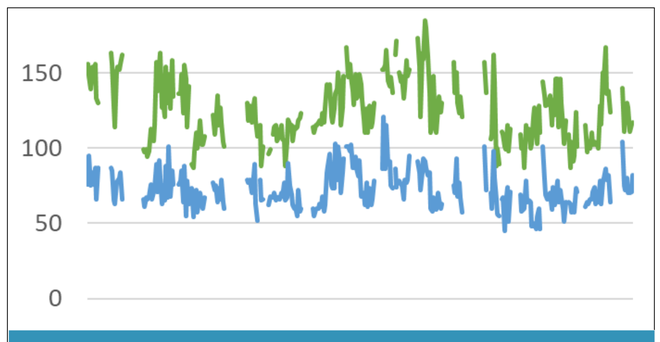
Study design



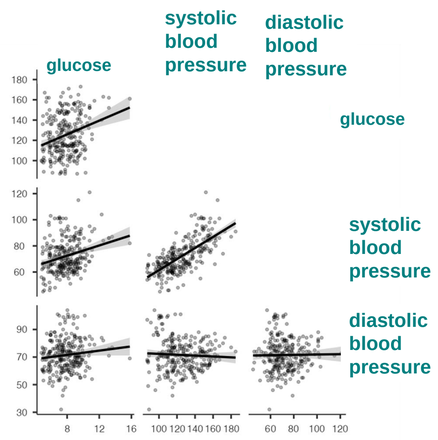
A prospective analysis of 40 patients (28 men and 12 women) was conducted. To assess GV in different categories, all patients were divided into several groups: group I – T2DM without history of severe comorbid pathology (n=22), group II – with T2DM and/or ASCVD, CHF, CKD (n=18). After that patients were selected for groups III and IV depending on the presence of diseases of only cardiac (n=10), or cardiorenal systems (CRS) (n=10) respectively. The third stage of our study was to assess the effect of preferential drugs (SGLT-2 inhibitors, GLP-1 RA) on reducing GV. All patients from group II during the study were transferred from traditional GLD to innovative ones in order to evaluate deprescribing therapy. The 4th stage was to assess the correlation between glucose levels during the day, blood pressure and heart rate in patients with cardiorenal pathology. Glycemic levels in all patients were assessed using FreeStyle Libre flash glucose monitoring with subsequent calculation of GV indices, as well as 24-hour monitoring of blood pressure and heart rate. Statistical data processing was performed using the statistical software package "Excel" ("Microsoft"), the program "Statistica 10" ("Statsoft Inc").

RESULTS

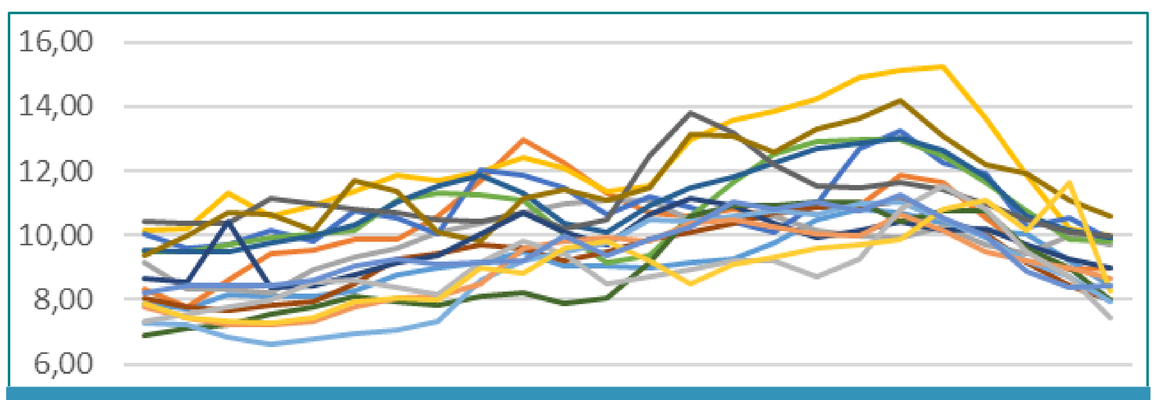
II group patients compared with I group patients had higher blood glucose (BG) levels (8.4 [7.54; 9.26] vs 6.15 [5.68; 6.62], p<0.001) and more pronounced GV (5.76 vs 3.0, p<0.001). III group patients had lower BG levels (9.11 [7.95; 10.3] vs 6.89 [6.72; 7.47], p <0.01) and MAGE (6.32 vs 4.50, p <0.038) compared with IV group patients. When assessing the impact of innovative GLD, no significant differences in relation to the average BG level (8.49 [7.19-9.79] vs 8.16 [6.9-9.23], p <0.58) were obtained, however, there was a pronounced decrease in the MAGE index (5.18 vs 3.9, p < 0.001). When analyzing data from 24-hour glucose and blood pressure monitoring, a strong positive correlation between SBP and glucose (r= 0.283; p <0.001), DBP and glucose (r= 0.266; p <0.001) was noted. There was no correlation between the indicators of GV, blood pressure and heart rate.



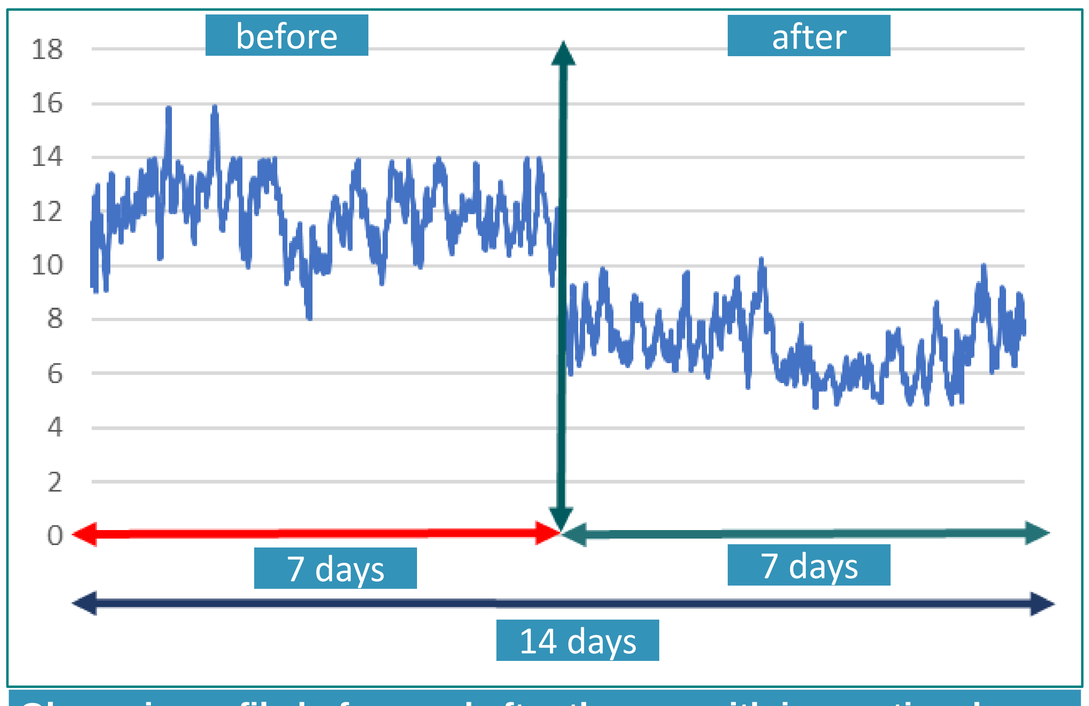
Daily blood pressure profiles



The relationship between blood pressure and glucose



Daily glycemic profiles



Glycemic profile before and after therapy with innovative drugs.

CONCLUSIONS

Our results showed that the presence of comorbid pathology in patients with T2DM was associated with high GV and high BG levels. There was a significant decrease in GV when prescribing preferential GLD, despite comparable values of BG indicators. The analysis included there was a positive correlation between glucose and blood pressure levels, which may indicate the relationship of these indicators, as well as their possible mutual influence on the severity of diabetes, and CHF, CKD.