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Parsa Paryavi, Vahid Rasekhjahromi

RESULTS OF CONTINUOUS GLUCOSE MONITORING IN PATIENTS WITH TYPE 1 DIABETES

Tutor Ph.D., assoc.prof. Shyshko V. M.
Department of Endocrinology
Belarusian State Medical University, Minsk

Background. Continuous Glucose Monitoring (CGM) has been approved to be a useful device that can reduce the risks of hypo- and hyperglycemia, glycemic variability and can improve quality of the patient with diabetes. Also, CGM use can help reduce HbA1c and mean glucose. It's clinically useful in both type 1 and type 2 diabetes for the patients who undergo several types of treatment regimens. CGM is really useful for both multiple daily injections or continuous subcutaneous insulin infusion.

Aim: was to determine typical deviations of glucose and mistakes in insulin treatment, self-control, predisposing to the poor blood control.

Materials and Methods. In this evaluation 167 patients with diabetes type 1 in period of 4 to 8 days were included but for more accurate results 32 subjects were excluded due to monitoring less than 6 days. The remaining 135 patients were 90 women and 45 men. Including criteria: type 1 diabetes, basal-bolus regimen of insulin injection. Excluding criteria: acute diseases, failure of chronic diseases. Constant glucose monitoring (CGM) was conducted using blinded system. CGM lasted 6 to 8 days in all patients and an average of 1732 readings were measured for each patient by device. According to the protocol patients should have recorded in diary carbohydrates (CH) amount, doses of insulin and measure glucose levels with glucometer at least 4 times a day.

Results and discussion. We revealed statistically significant difference between HbA1c (8.9±2.1%) measured in laboratory during CGM and calculated HbA1c (7.1±1.1%) measured during monitoring (according to the results of standardized protocol) ($p<0.05$). As far as patients were instructed to record CH, insulin doses and blood glucose levels measured at least 4 times a day it's possible to assume that one or all parts of this daily routine are lost in patients with diabetes who didn't achieve target HbA1c. Increased blood glucose levels during night (44.51±26.71%) were associated with higher HbA1c during CGM ($r=0.5$, $p<0.05$). The higher dose of basal insulin (21.08±9.61U) was associated with higher HbA1c measured in laboratory ($r=0.5$, $p<0.05$) and increased glucose during night ($r=0.5$, $p<0.05$). Also we calculated Glucose target above range (TAR) (37.37±19.68%) and Glucose Target in range (TIN) (54.39±18.08%), Mean glucose (8.81±1.84) and glucose target below range (TBR) (8.37±8.48%). Target value for TIR is more than 70% and we found out that 17.8% (24 patients) reached that target. Target value for glucose TAR is not more than 25% and we found out that glucose of 31.1% (42 patients) was less than 25% and target value for glucose TBR is less than 4% and we found out that 33.33% (45 patients).

Conclusion. 1. Calculated HbA1c and laboratory HbA1c differ for approximately 2% in patients with poorly controlled diabetes. 2. Nocturnal hyperglycemia is associated with higher HbA1c level and higher doses of basal insulin. 3. Only 17.7% of patients reach target values for TIR.