

II INTERNATIONAL CONFERENCE
Krasnoyarsk-St Petersburg, RUSSIA
3-6 March 2021



«Metrological Support of Innovative Technologies» ICMSIT-II 2021

«APPLICATION OF HIGH TECHNOLOGIES IN MODERN DIABETOLOGY
CONTINUOUS MONITORING OF BLOOD GLUCOSE LEVEL AS ECG

DIABETES»

Authors

EV Sakhabieva, S Levit,

I N Musin,

M S Lisanevich, E E Tsareva



ICMSIT

Metrological Support
of Innovative Technologies

Problem statement

- Problem statement
- Task 1 Currently, the number of people with type 2 diabetes mellitus (T2DM) is growing steadily. According to the International Diabetes Federation (IDF), today there are about half a billion people in the world who suffer from this disease, one third of which is people over 65 years old
- Task 2 IDF estimates that diabetes mortality rates exceed those associated with other non-communicable diseases.
- Task 3 Nowadays CGM can definitely be called "ECG diabetes" and it is widely used in medical practice to treat the disease. Continuous monitoring of blood sugar level becomes the necessary tool for motivating people to change their lifestyle and it is very important component of effective treatment. With a therapeutic approach from the position of a "gravicentric concept" based on lowering glucose level by reducing the patient's weight, remission of the disease and complete restoration of carbohydrate metabolism are no longer a myth. According to recent researches the transition of therapeutic goals from blood glucose targets (HBA1C) to metabolic goals (reducing body mass index - BMI) leads to quick results.



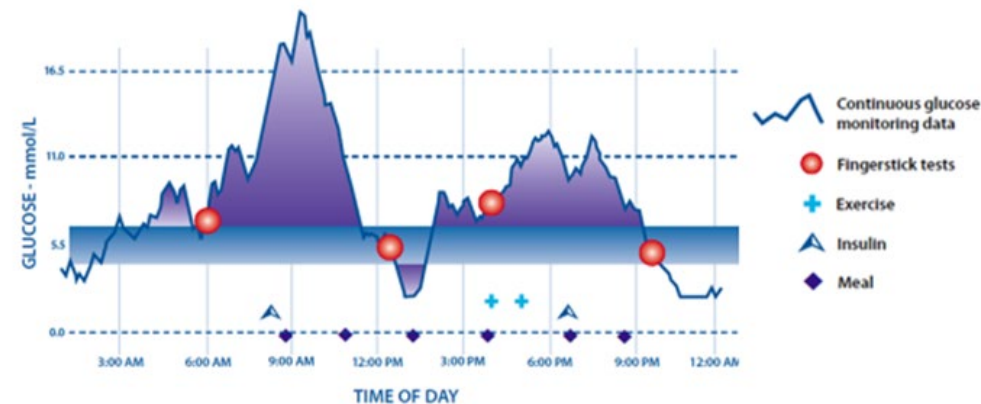
ICMSIT

Metrological Support
of Innovative Technologies

Solution methods

- Millions of people with diabetes measure their blood glucose with glucometers which are portable blood glucose monitoring systems. These devices measure glucose in capillary blood, usually taken from the finger. Since the 1990s, monitoring of glucose levels on an outpatient basis has become commonplace. SMBG is also used by medical professionals in various medical institutions. Throughout the 1990s, technological advances made these devices more reliable, compact and easy to use .
- However, single SMBG measurements do not show the full picture of the change in blood glucose in the patient's body, since this parameter can change almost every second.
- Sharp fluctuations in glucose levels, which are of great danger to the patient, may go unnoticed, even if the check is performed every hour.
- Unlike SMBG, CGM systems provide a continuous series of glucose readings throughout the day. Moreover, the measurement of glucose concentration is carried out in the interstitial fluid, and not in the blood. This is due to the fact that the CGM data, as a rule, do not coincide with the SMBG data exactly. In other words, there is the so-called delay effect by equalizing glucose levels in different body environments. However, CGM systems allow you to see how the glucose level changes throughout the day, after eating, taking medicines or physical activity in detail. To evaluate glycaemic parameters correctly, the area of normal glucose values is highlighted in color in the graph displayed on the receiving device

Even patients with acceptable A1C levels can experience glycaemic variability



ICMSIT

Metrological Support
of Innovative Technologies

Conclusions

Results, implementation

- CGM monitoring allowed us to come to the following conclusion: apparently, in patients with T2DM the coefficient of variability is an easily accessible and most informative index confirming the restoration of functional abilities and secretion of endogenous insulin through metabolic recovery.
- Thus, CGM has become the “gold standard” tool for the latest therapeutic approaches in T2DM



ICMSIT

Metrological Support
of Innovative Technologies

Contacts

EV Sakhabieva³, S Levit^{1,2,3}, I N Musin³, M S Lisanevich^{3,4}, E E Tsareva³

¹Institute of Endocrinology and Metabolism, Assuta Medical Center, 20 Habarzel St, Ramat Hachayil, Tel Aviv, 69710, Israel

²Sheba Medical Center, Institute of Endocrinology, Ramat Gan, Israel

³Medical Engineering Department, Kazan National Research Technological University, 68 Karl Marx St., Kazan, 420015, Russian Federation

E-mail: lisanevichm@gmail.com

II INTERNATIONAL CONFERENCE
Krasnoyarsk - St Petersburg, RUSSIA
3-6 March 2021

«Metrological Support of Innovative Technologies»
ICMSIT-II 2021