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**New standards for regulation of carbohydrate metabolism in critical patients  
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Hyperglycemia requires special attention in patients with critical conditions. Overall objective of the study: develop new standards of management of hyperglycemia in patients with critical conditions. Aims: 1. Dynamic analysis of glycemic profile in diabetic patients with critical conditions, testing levels of glycolysed hemoglobin (gKHbA<sub>1</sub>). 2. Dynamic analysis of glycemic profile in nondiabetic patients with critical conditions, testing levels of glycolysed hemoglobin (gKHbA<sub>1</sub>). Materials and methods: Group Ia: 20 patients with manifested type 1 diabetes on insulinotherapy with acute myocardial infarction as a complication. Group Ib: 20 patients with manifested type 1 diabetes on insulinotherapy with ischemic stroke. Group II: patients with the same profiles as above, but without diagnosed diabetes prior to their admission to the clinic (groups IIa and IIb). Glycemia was measured in all the patients every 3 hours on day 1, 3 and 6 of the admission. Glycolised hemoglobin (gKHbA<sub>1</sub>) was checked at admission in all the patients. In the initial phase of the development of a critical condition, stress hyperglycemia develops in both: patients with previously diagnosed diabetes mellitus, as well as non diabetic patients. In the initial phase of the management of patients with critical conditions, it is advised to measure glycolised hemoglobin and monitor daily glycemic profile.

**Keywords:** Critical condition, Hyperglycaemia, Diabetes.

**Introduction:** Hyperglycemia requires special attention in patients with critical conditions. It might have various causes: existing diabetes, diabetes induced by the critical condition, hyperglycemia caused by stress or iatrogenic hyperglycemia (1,2,3). The main pathogenical cause is believed to be stress, caused by the critical condition (1, 4), and hyperglycemia being one of the components of this stress (4). Hyperglycemia develops in diabetic patients, as well as nondiabetic patients suffering with various angiologic, cardiologic, nephrologi, gastrointestinal critical conditions and seriously aggravates their condition. Despite its cause, hyperglycemia has a negative effect on the flow and outcome of the disease and its timely detection and differential diagnosis is absolutely necessary to find the right approach of the treatment.

Overall objective of the study: develop new standards of management of hyperglycemia in patients with critical conditions.

**Materials and Methods:** Group Ia: 20 patients with manifested type 1 diabetes on insulinotherapy with acute myocardial infarction as a complication. Group Ib: 20 patients with manifested type 1 diabetes on insulinotherapy with ischemic stroke. Group II: patients with the same profiles as above, but without diagnosed diabetes prior to their admission to the clinic (groups IIa and IIb).

Glycemia was measured in all the patients every 3 hours on day 1, 3 and 6 of the admission. Glycolised hemoglobin (gHbA<sub>1</sub>) was checked at admission in all the patients.

**Results and Discussion:** In both subgroups of group I persistent high hyperglycemia (300-450mg%) and moderately elevated gHbA<sub>1</sub> (M=7,9) were observed. On the third day glycemic profile indicators were improved in the patients with Acute Myocardial Infarction (AMI). All of these patients were prescribed rapid acting insulin Actrapid injections at admission. On the third day the patients with AMI in group Ia showed the tendency of improved overall glycemic curve (without significant increase in Insuline dose), which was not observed in group Ib – patients with ischemic stroke, despite of increased insulin dosis in these patients, which indicates insulinresistance and persistent stress induced hyperglycemia. By the sixth day, patients with AMI showed complete compensation of carbohydrate metabolism, less observed in patients with acute ischemic stroke. This group showed a positive correlation between extension of ischemic area and level of hyperglycemia (pic. 1,2,3). This makes us think, that activation of stress hyperglycemic factor takes place in the initial phase in the diabetic patients

with critical condition suffering from AMI and acute ischemic stroke, as the level of glycolized hemoglobin was not critical, unlike severe impairment of carbohydrate metabolism, assessed through glycemic profile at admission. Further dynamics of hyperglycemia indicates the strength of stress hyperglycemia and insulinresistance primary in patients with ischemic stroke. In the second group of patients impaired overnight glycemic curve was observed in 8 patients with AMI and 10 patients with ischemic stroke, from these patients, high glycolised hemoglobin was observed in 2 patients with cardiological condition and 3 patients with neurological condition. Glycemic indicators in the consecutive days (third and sixth) were elevated in 5 patients with impaired glycemic hemoglobin. Accordingly, these 5 patients were diagnosed with diabetes and were prescribed insulin. The other 13 patients with impaired initial glycemic profile showed expressed normalized glycemia on second and third days without any specific treatment. All the above mentioned indicates the importance of measuring glycolized hemoglobin in all the patients with critical conditions, to be included in the standard management of patients with critical conditions.

Conclusions:

1. In the initial phase of the development of a critical condition, stress hyperglycemia develops in both: patients with previously diagnosed diabetes mellitus, as well as non diabetic patients.
2. In the initial phase of the management of patients with critical conditions, it is advised to measure glycolised hemoglobin and monitor daily glycemic profile.

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კრიტიკული პათოლოგიის განვითარების საწყის ეტაპზე ადგილი აქვს სტრესულ ჰიპერგლიკემიას, როგორც ადრე მანიფესტირებულ შაქრიანი დიაბეტით, ისე მის გარეშე პაციენტებში; კრიტიკული პაციენტის მართვის საწყის ეტაპზე მიზანშეწონილია სისხლში გლიკოლიზირებული ჰემოგლობინის განსაზღვრა და სადღეღამისო გლიკემიური პროფილის მონიტორინგი.