

**The Effect of HbA1c on Cognitive Functions in Children with Type 1  
Diabetes Mellitus**

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**Annotation:** The association between diabetes mellitus and cognitive impairment was first hypothesized in 1922. In recent years, complications of diabetes that arise from the central nervous system have been studied more extensively. Clinically significant cognitive dysfunction leads to impaired work capacity and social adaptation, as well as a deterioration in the quality of life of patients with diabetes mellitus [1].

**Keywords:** diabetes mellitus, children, glycated hemoglobin (HbA1c), cognitive impairment.

**Objective of the study:** The aim of this review is to investigate the effect of HbA1c on cognitive impairment in children with type 1 diabetes mellitus.

**Research methods:** Scientific books, reviews of clinical studies, and scientific articles published in recent years were used for this research.

**Research Results and Their Discussion:** To determine the outcomes, we examined data from 102 children with diabetes. The duration of their illness was up to 3 years, 4–6 years, and more than 6 years. In these patients, the levels of glycated hemoglobin (HbA1c) and its impact on cognitive function were studied.

**Table 1.**

**Description of carbohydrate metabolism indicators (Me [Q1; Q3])  
depending on the duration of the disease in patients with type 1 diabetes.**

	Disease duration			P
	Up to 3 years (n=33)	4-6 years (n=32)	More than 6 years (n= 37)	

Glycated hemoglobin (HbA1c), %	10,9 [8,3; 13,8]	10,4 [8,6; 12,6]	11,4 [9,9; 13,8]	0,675
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**Note:** \* – the differences between the indicators are statistically significant ( $p < 0.05$ ).

The level of glycated hemoglobin in children with a disease duration of less than 3 years was 10.9%. In the group of children with a disease duration of 3 to 6 years, this indicator was 10.4%, while in children with a longer disease history, the HbA1c level reached 11.4%. Thus, when comparing HbA1c (%) levels according to the “disease duration” indicator, no statistically significant differences were found ( $p = 0.675$ ) (method used: Kruskal–Wallis test). Nevertheless, it is not possible to completely rule out the likelihood that glycated hemoglobin levels may be associated with the duration of diabetes [2].

**Conclusions:** The most significant factors contributing to the development of metabolic changes leading to diabetic encephalopathy include the period of diabetes manifestation, the duration of the disease, and chronic hyperglycemia. In children and adolescents with type 1 diabetes, the main clinical complications affecting the brain are cognitive impairments; their prevalence is high and increases with longer disease duration.

#### References:

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