

## **ASSESSMENT OF HEARING FUNCTION IN INDIVIDUALS WITH TYPE 2 DIABETES**

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**Abstract:** The problem of combating diabetes mellitus (DM) is becoming more and more relevant for modern medicine from year to year, due to the widespread increase in incidence throughout the world[6,7,8,9]. Features of the conditions and lifestyle of people in the 21st century associated with hypokinesia; consumption of foods high in carbohydrates, salt, fats, synthetic additives; frequent stressful situations caused by the accelerated pace of life; bad habits and many other factors underlie weight gain, the development of metabolic syndrome (MS) and type 2 diabetes (T2DM) [1,2,3,4]. Multiple genetic and environmental factors that contribute to the spread of this pathology also have an important influence[16,17,18].

**Keywords:** cognitive decline, oxidative stress, neuropathy, reaction time, metabolic syndrome, type 2 diabetes mellitus, glycated hemoglobin.

### **INTRODUCTION.**

The problem of combating diabetes mellitus (DM) is becoming more and more relevant for modern medicine from year to year, due to the widespread increase in incidence throughout the world[6,7,8,9]. Features of the conditions and lifestyle of people in the 21st century associated with hypokinesia; consumption of foods high in carbohydrates, salt, fats, synthetic additives; frequent stressful situations caused by the accelerated pace of life; bad habits and many other factors underlie weight gain, the development of metabolic syndrome (MS) and type 2 diabetes (T2DM) [1,2,3,4]. Multiple genetic and environmental factors that contribute to the spread of this pathology also have an important influence[16,17,18].

**RELEVANCE.** Today, diabetes is one of the most common non-infectious human diseases after cardiovascular and oncological pathologies, leading to disability and, often, death. Diabetes, often referred to simply as diabetes, is a serious, chronic, progressive disease characterized by elevated serum glucose levels (hyperglycemia) that is associated with various underlying conditions such as blurred vision, poor wound healing, erectile dysfunction, kidney failure, heart disease and etc. Many researchers note that the prevalence of diabetes is steadily increasing throughout the world[5,17]. The annual statistical assessment of the incidence of diabetes by WHO shows that in 2014, 422 million adults worldwide suffered from this disease, showing a steady increase from year to year. Concerns are also raised by the fact that the number of undiagnosed cases of the disease is about 50% of the number officially registered[13,14,15]. According to WHO documents, the disease can be diagnosed in most people several years after its onset, after complications have arisen. The global prevalence of diabetes among people over 18 years of age increased from 4.7% in 1980 to 8.5% in 2014. It is believed that over the next 20 years the number of people with diabetes will almost double[10,11,12]. The International Diabetes Federation (2013) estimates that by 2040, one in 10 adults will have diabetes. It is known that the vast majority of patients suffering from this

pathology have type 2 diabetes. This so-called non-insulin-dependent or adult-onset diabetes is, as a rule, a consequence of an unhealthy lifestyle, the result of excess body weight and physical inertia. The fact that “until recently, diabetes of this type was observed only among adults, but now it also affects children” is also of great concern. According to the basic facts presented by WHO, diabetes is a chronic disease that develops when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces[19,20,21].

**PURPOSE OF THE STUDY.** To assess peripheral nerve damage in patients with diabetes mellitus (DM) and identify differences in response and perception speeds according to age groups, duration of type 2 diabetes (T2DM), fasting plasma glucose and glycated hemoglobin (HbA1c levels), and also compare them with those in healthy people.

**MATERIALS AND METHODS OF RESEARCH.** The study was conducted at the Samarkand branch of the Republican Scientific and Practical Center of Endocrinology. A total of 64 patients diagnosed with T2DM and 64 healthy controls were included in the study. A finger-tapping test, visual and auditory response tests were carried out, respectively. Fasting plasma glucose and HbA1c levels were recorded, and disease duration was assessed. The analysis of the obtained data was carried out using SPSS version 25. Differences were considered statistically significant at a p value <0.05.

**RESEARCH RESULTS.** It was noted that control group participants aged 18 to 34 years showed faster reaction in all tests ( $p=0.01$ ), but differences in reaction speed in both groups decreased with increasing age. Positive correlations were revealed between the duration of T2DM and the results of visual and auditory tests ( $r=0.69$ ,  $p<0.05$ ;  $r=0.52$ ,  $p<0.05$ , respectively). There was also a positive correlation between HbA1c level (%) and visual reaction test results ( $r=0.97$ ,  $p<0.05$ ).

**CONCLUSION.** As HbA1c levels and duration of T2DM increased, patients' reaction speed and perceptual skills decreased. There was a rapid decline in cognitive function, especially in the early stages.

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