



## ULTRASOUND DOPPLER EXAMINATION OF THE MAIN VESSELS OF THE NECK IN PATIENTS WITH CHRONIC CEREBRAL ISCHEMIA WITH TYPE 2 DIABETES MELLITUS

O. B. Najimitdinov

Andijan State Medical Institute

### Abstract

Both large and small vessels run through the brain. They supply this most important organ of the human body with blood. The brain consumes more blood than any other organ. It needs a huge amount of oxygen every second. Therefore, any vascular lesion affects its work in the form of neurological and mental disorders. Chronic cerebral ischemia (CCI) is one of the pathologies of the vessels that run through this organ. Diagnosed in time, the disease can be corrected without affecting physical and mental health and life expectancy.

**Keywords:** Chronic cerebral ischemia, type 2 diabetes mellitus, ultrasound Doppler ultrasonography of the main vessels of the neck

### Introduction

Vascular pathology develops primarily in old age. There is a hereditary predisposition. If parents had a stroke or encephalopathy, their children, when they reach old age, are also likely to suffer from vascular pathologies. Hereditary factors and age cannot be influenced, but it is possible to slow down the development of the disease or even prevent it altogether. The main risk factors are atherosclerosis and hypertension. Problems with blood vessels leads to diabetes, obesity, sedentary lifestyle, bad habits, unbalanced diet. In these cases, changes in blood composition, atherosclerotic plaques appear on blood vessels. Cystic fibrosis develops due to emboli, atherosclerotic stenosis, and thrombosis. Spinal diseases, spasms of the neck muscles, blood abnormalities that lead to increased clotting may be a provoking factor. The cause of the disease may be a deformation of the vertebral arteries caused by heredity or temporary disturbance of blood flow in them. Patients with type II diabetes mellitus (T2DM) are at risk for cerebrovascular disease, often due to impaired cerebral hemodynamics. We present a systematic review of studies assessing cerebral hemodynamics by transcranial Doppler (TCD) in DM2. In this review, we include cross-sectional, prospective, retrospective, randomized controlled, and crossover studies. Symptoms of cerebral ischemia are not always evident. In some people, the disease does not reveal itself at all. Vascular pathology can only be found during a





screening examination. So far, screening of cerebral vessels is not included in medical check-ups. But everyone can be examined independently. Timely detection of vascular abnormalities and subsequent management of such patients makes it possible to reduce the probability of stroke by 50%. The same applies to senile dementia. Doppler ultrasound and many other hardware and laboratory techniques. Diagnosis should be comprehensive. Simultaneously with the examination of blood vessels on the machines, blood tests should be taken. Such parameters as blood concentrations of cholesterol, glucose, and lipid fractions are important for diagnosis.

The aim of the study was to evaluate the Doppler characteristics of diabetic patients compared to healthy controls

This prospective study was conducted at Andijan Hospital between January and September 2022. Forty patients aged 48-67 years diagnosed with diabetes mellitus and an age- and sex-matched control group were included in the study. 30 healthy subjects. The diabetic patients were divided into two subgroups based on the duration of diabetes (<5 and  $\geq 5$  years). Study patients had no risk factors for cerebrovascular disease other than type 2 DM. The healthy control group had no risk factors for cerebrovascular disease, including smoking, arterial hypertension, dyslipidemia, obesity, and diabetes. Study patients were treated with oral antidiabetic drugs. The study patients had no signs of cerebrovascular disease and had no anatomical changes of the villous circle at the time of inclusion. TCD was performed by leaning a 2 MHz pulsatile ultrasound transducer (Transscan 30 EME, Uberlingen, Germany) against the temporal windows and screening blood flow in the vessels of the villous circle according to standard criteria.

## Results

In a study population of 40 patients (16 men, 24 women) with type 2 diabetes mellitus (age 48 to 67 years, mean age  $58 \pm 2$  years) and a control group of the same age and sex, consisting of 30 healthy people without diabetes, the TCD study revealed two specific types of hemodynamic changes in diabetic patients. One was an attenuation of the cerebral spectra and a slowing of the MCSCs in all or most of the arteries of the circle of viscera, indicating cerebral microangiopathy. Another change was acceleration of ICS, turbulence, and abnormal sound phenomena in some arteries of the viscus circle, indicating atherosclerotic plaques and stenosis of the arteries of the viscus circle or macroangiopathy. As the disease progresses, it goes through three stages. At the initial stage, minor symptoms of neurological nature are observed. Headache and dizziness occur. In the second stage, subcompensation occurs. Symptoms progress up to the development of depression, the first signs of personality





change appear. The third stage is decompensation. It comes to severe neurological disorders, vascular dementia. Chronic ischemia of the brain in the future leads to a stroke or dementia. Having detected the first symptoms of this disease, it is necessary to undergo a complete vascular examination, and if abnormalities are found - to begin treatment.

## Conclusions

Cerebral autoregulation is often impaired in DM2 patients. The risk increased with increasing duration of DM2, The worse the blood supply of neurons in the brain, the more the disease progresses, deepens, develops foci of infarction. That the prevalence of cerebral hemodynamic abnormalities is statistically significantly higher in diabetic patients compared to healthy controls without diabetes. The duration of diabetes mellitus plays an important role in the development of pathological changes in the cerebral vessels. On the other hand, it was found that the duration of diabetes predicts the development of atherosclerotic processes in the cerebral vessels. All our diabetic patients in these patients showed signs of cerebral angiopathy, affecting cerebral perfusion and probably gradually leading to cerebral autoregulation collapse.

## Literature

1. Azimov M. I., Shomurodov K.E. A technique for Cleft Palate Repair. Journal of research in health science. Vol. 1, No. 2, 2018, pp. 56-59.
2. Khamdamov B.Z. Indicators of immunocytocine status in purulent-necrotic lesions of the lower extremities in patients with diabetes mellitus.//American Journal of Medicine and Medical Sciences, 2020 10(7) 473-478 DOI: 10.5923/j.ajmm.2020.-1007.08 10.
3. M. I. Kamalova, N.K.Khaidarov, Sh.E.Islamov, Pathomorphological Features of hemorrhagic brain strokes, Journal of Biomedicine and Practice 2020, Special issue, pp. 101-105
4. Kamalova Malika Ilkhomovna, Islamov Shavkat Eriyigitovich, Khaidarov Nodir Kadyrovich. Morphological Features Of Microvascular Tissue Of The Brain At Hemorrhagic Stroke. The American Journal of Medical Sciences and Pharmaceutical Research, 2020. 2(10), 53-59
5. Khodjjeva D. T., Khaydarova D. K., Khaydarov N. K. Complex evaluation of clinical and instrumental data for justification of optive treatment activities in patients with resistant forms of epilepsy. American Journal of Research. USA. № 11-12, 2018. C.186-193.





6. Khodjieva D. T., Khaydarova D. K. Clinical and neurophysiological characteristics of post-insular cognitive disorders and issues of therapy optimization. *Central Asian Journal of Pediatrics*. Dec.2019. P 82-86
7. Sadridin Sayfullaevich Pulatov. (2022). Efficacy of ipidacrine in the recovery period of ischaemic stroke. *World Bulletin of Public Health*, 7, 28-32.
8. Tukhtarov B.E., Comparative assessment of the biological value of average daily diets in professional athletes of Uzbekistan. *Gig. Sanit.*, 2010, 2, 65–67.
9. Исмоилов, О., Камалова, М., Анваршад, Т., & Махмудова, С. (2021). Кратко об анатомо-физиологических особенностях стопы и применение некоторых комплексных упражнений для устранения плоскостопия. *Збірник наукових праць SCIENTIA*. вилучено із <https://ojs.ukrlogos.in.ua/index.php/scientia/article/view/9999>
10. Ergashovich, K. B., & Ilhomovna, K. M. (2021). Morphological Features of Human and Rat Liver and Biliary Tract Comparisons (Literary Review). *International Journal of Discoveries and Innovations in Applied Sciences*, 1(4), 27–29.
11. Камалова, М., Исмоилов, О., Азимова, А., Бекмуродова, Д., & Исматова, С. (2021). Варианты конституции тела человека. *Збірник наукових праць scientia*.
12. Маматкулов Б., Камалова М., Аширов М. Причины, механизмы повреждения, основные типы переломов пяточной кости // *Збірник наукових праць SCIENTIA*. – 2021.
13. Kamalova M., Khaidarov N., Shomurodov K. Microscopic examination of brain tissue in hemorrhagic stroke in uzbekistan // *Матеріали конференцій МЦНД*. – 2021.
14. Kamalova, M., Ismatova, S., Kayumova, S., Gulomova, S., & Akhmedova, J. (2021). Blood supply to the shoulder and forearm muscles in the human foetus. *Збірник наукових праць ЛОГОΣ*.
15. Khaidarov Nodir Kadyrovich, Shomurodov Kahramon Erkinovich, & Kamalova Malika Ilhomovna. (2021). Microscopic Examination Of Postcapillary Cerebral Venues In Hemorrhagic Stroke. *The American Journal of Medical Sciences and Pharmaceutical Research*, 3(08), 69–73.