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COGNITIVE IMPAIRMENT IN DIABETES MELLITUS

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ABSTRACT: The aim of the study was to evaluate cognitive functions in patients with type 2 diabetes mellitus (DM2) and arterial hypertension (AH) and the effectiveness of Ginkgo biloba extract. Patients and methods. 120 patients with DM2 and 50 with hypertension were examined without complications, who had not suffered a stroke and/or myocardial infarction, without active complaints of memory loss and other cognitive functions. Exclusion criteria: stroke and/or myocardial infarction, clinically significant diseases of the peripheral arteries and main arteries of the head, decompensation of DM2, decreased glomerular filtration rate <60 ml/min, the presence of proliferative retinopathy and other endocrine diseases. The following methods of assessing cognitive functions were used: the short mental status assessment scale, the Montreal Cognitive Function assessment scale, and the hand-eye coordination test (Parts A and B). Results and discussion. In 85% of patients with DM2, cognitive impairment (CD) was revealed: impaired attention, short-term memory, and speed of thinking. Of these, 82.5% had moderate cognitive decline, and 2.5% had dementia. 30% of patients with hypertension were diagnosed with moderate hypertension, 10% with dementia. At the same time, the severity of CN in patients with DM2 was higher than in patients with hypertension. Ingestion of Egb 240 mg/day for 3 months had a statistically significant positive effect on cognitive functions (improvement of short-term memory, concentration, speed of thinking) and daily activity. Conclusion. The authors believe that CN is the first sign of encephalopathy in DM2. It was also noted that DM2 has a more pronounced effect on cognitive functions than AG. Egb can be used as an effective drug for the treatment of CN in these diseases.

Keywords: type 2 diabetes mellitus; diabetic encephalopathy; cognitive impairment; cognitive functions; arterial hypertension; Egb

INTRODUCTION

Cognitive functions are considered as one of the most subtle markers of cerebral dysfunction, which makes it possible to diagnose disorders at the preclinical stage, i.e. before the appearance of persistent "organic" symptoms. Diabetes mellitus (DM) is a metabolic disease that, according to the definition of WHO and the United Nations, has an epidemic character of growth. Type 2 diabetes (DM2) causes many complications (nephropathy, retinopathy, angiopathy, polyneuropathy), which have been studied in detail and are well diagnosed by doctors. Cerebral dysfunction in DM2, despite the long history of the term "diabetic encephalopathy" has not been studied enough. A number of studies confirm that cognitive deficits are one of the first signs of brain suffering in DM. The aim of the study was to study the state of cognitive functions in DM2 and hypertension (AG) and the effectiveness of the standardized extract Ginkgo biloba Egb in their correction.

MATERIALS AND METHODS OF RESEARCH

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60 patients with DM2 comprised the DM2 group: 35 women and 25 men, the average duration of the disease was 10.84±8.2 years, the average body mass index was 32.62±5.49, the fasting blood glucose level was 7-10 mmol/l, 2 hours after meals – 10-15 mmol/l, the level of glycated hemoglobin was 6.5–7%. Inclusion criteria: diagnosed with DM2, compensation stage, age 40-75 years, absence of active complaints of memory impairment or other cognitive functions on the part of the patient and his relatives. Exclusion criteria: previous stroke and/or myocardial infarction, clinically significant diseases of the peripheral arteries and main arteries of the head, decompensation of DM2, decreased glomerular filtration <60 ml/min, the presence of proliferative retinopathy and other endocrine diseases. Concomitant hypertension was diagnosed in 50 (90%) patients with DM2. These patients were included in the second group (AH group): 35 women and 15 men with AH, who corresponded to the DM2 group according to parametric parameters. Inclusion criteria: the presence of hypertension, the absence of active complaints of memory impairment or other cognitive functions on the part of the patient and his relatives. Criteria exceptions: stroke and/or myocardial infarction, clinically significant diseases of the peripheral arteries and main arteries of the head, the presence of endocrine diseases. Informed consent has been obtained from each patient. The neuropsychological study used a brief the Mental Status Assessment Scale (KSHOPS). Evaluation of the results on this scale: 28-30 points – no cognitive impairment, 24-27 points – moderate cognitive impairment, 20-23 points – mild dementia, 11-19 points – moderate dementia, 0-10 points – severe dementia. They also used The Montreal Cognitive Assessment Scale (Montreal Cognitive Assessment, MoCA test); result <26 scores were regarded as a cognitive decline. A hand-eye coordination test was used (Trail Making Test, TMT). Evaluation of the results of Part A of the test (TMT-A): up to 78 s – no violations, >78 s – decrease in the speed of thinking; part B (TMT-B): up to 273 s – normal, >273 s – decrease in the speed of thinking the obtained results were processed using the Statistica 6.0 program. Descriptive statistics were used to evaluate the samples, the data are presented in the form of averages and standard deviations. Since the samples were unrelated and had a distribution different from normal, the nonparametric Mann–Whitney criterion (U-test) was used to compare the two groups, and the correlation method was used Spearman, indicating the level of correlation (p) and the strength of correlation (r). A nonparametric criterion was used to compare the results before and after treatment of patients Wilcoxon. 34 patients with DM2 and 6 patients with hypertension with cognitive impairment were prescribed standardized Gingko biloba extract Egb at a dose of 120 mg 2 times a day in the morning and afternoon daily for 3 months, 15 patients were included in the control group. Repeated testing was performed 1, 2 and 3 months after the start of treatment.

THE RESULTS AND THEIR DISCUSSION

In the DM2 group, the CSOPS scores were 26.04±1.87 points, and the MoSA test score was 22.05±3.45 points, TMT-A – 73.61±21.47 s, TMT-B – 138.7±68.41 s. In the group The following results were obtained: CSHOPS – 26.93±1.75 points, MoSA test - 23.85±2.47 points, TMT–A - 82±21.5 s, TMT–B - 201.5±22.8 s. Significant differences were revealed between all indicators in patients of the DM2 and AH groups, the severity of CN was not it depended on the duration of DM2 (p=0.09) and hypertension (p=0.1). While taking EGb, the number of patients who had decreased indicators of cognitive functions, decreased Indicators of CSOPS and MOSATEST increased as therapy continued: after 3 months of treatment, they were significantly higher than after the 1st and 2nd months of treatment

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(KSHOPS – p=0.00029, p=0.00004; MoCA test – p=0.00004, p=0.0022). The improvement of short-term memory, attention and visual-constructive skills influenced the increase in indicators. The number of patients with DM2 who completed the TMT-B task in more than 278 seconds increased from 1st to 3rd month. The reason for this is that initially I could not execute TMT-B 31 patients, after 1 month of treatment – 28, after 2 months – 17 and after 3 months – 13. Thus, the general the indicators in this group worsened somewhat due to the fact that patients who initially did not complete the test (and were not included in the calculations of the test execution time) were able to do so during treatment, although their indicators did not reach the norm: after 1 month of treatment 3 patients performed the test with an average result of 286.5±8.66 s, after 2 months – 14 (311±27.54 s) and after 3 months – 18 (308.43±26.47 s). TMT results tended to improve with treatment, but differences between baseline data and indicators during treatment were statistically unreliable ($p>0.05$). In contrast to the DM2 group, the time to perform TMT-B in patients with hypertension decreased, which is due to the initial absence of patients among them who could not perform the test. The data before and after 3 months of treatment have statistically significant differences ($p<0.001$). In addition to improving cognitive functions, all patients with DM2 and hypertension noted an improvement in working ability, mood, sleep quality and stress resistance. In 5% of patients with DM2 who did not receive EGb, after 3 months, a decrease in cognitive test scores by 1 point was revealed due to a deterioration in short-term memory, in 95% of patients, the indicators remained the same as before treatment. A combination of SD2 and Hypertension has a more significant negative effect on cognitive functions than hypertension alone. Absence of other vascular risk factors in both groups, signs of an urgent vascular pathology of the brain (including according to 1.5 Tl magnetic resonance imaging) allows us to assume with a sufficient degree of confidence that metabolic disorders in DM2 lead to brain damage regardless of other factors, mainly due to the high sensitivity of neurons to impaired glucose metabolism and increased insulin resistance of brain tissue. Cognitive impairment may be a clinical marker of encephalopathy in DM (diabetic encephalopathy), which makes it possible to diagnose this pathology at an early stage. It can also cause cognitive decline, but in DM2, cognitive functions suffer more often and to a greater extent, which indicates a more significant damaging effect of metabolic disorders on brain tissue compared with disorders in hypertension.

CONCLUSIONS

Thus, CN is established in the majority of patients with DM2 and hypertension, while their severity in patients with DM2 is greater than in patients with hypertension. Egb has a positive effect on cognitive functions in DM2 and hypertension, which improves the performance of medical appointments, reduces the number of complications and improves the quality of life of patients.

LITERATURE:

1. Alisherovna, K. M., Akramovna, I. K., Bakhtiyorovich, U. J., Nizamitdinovich, K. S., Jasurovna, J. S., Kairatovna, R. A., & Abdukholikovna, E. S. (2023). Exacerbations of chronic obstructive pulmonary disease and coronary atherosclerosis. Journal of new century innovations, 39(1), 176-178.
2. Alisherovna, K. M., Islomovich, S. I., & Djamshedovna, K. D. (2024). PSYCHOEMOTIONAL STATE AND QUALITY OF LIFE IN PATIENTS WITH

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

SYSTEMIC LUPUS ERYTHEMATOSUS. Ta'lim innovatsiyasi va integratsiyasi, 31(2), 124-131.
3. Alisherovna, K. M., Khabibovna, Y. S., Nizamitdinovich, K. S., & Bakhtiyorovich, U. J. (2023). CYSTATIN and KIDNEY FUNCTION. Journal of new century innovations, 38(2), 220-225.
4. Alisherovna, K. M., Khabibovna, Y. S., Nizamitdinovich, K. S., & Bakhtiyorovich, U. J. (2023). CYSTATIN and KIDNEY FUNCTION. Journal of new century innovations, 38(2), 220-225.
5. Alisherovna, K. M., Nizamitdinovich, K. S., & Islomovich, S. I. (2024). THERAPY OF RHEUMATOID ARTHRITIS DURING PREGNANCYTHE. Ta'lim innovatsiyasi va integratsiyasi, 31(2), 172-180.
6. Alisherovna, K. M., Nizamitdinovich, K. S., & Islomovich, S. I. (2024). FEATURES OF BONE MINERAL DENSITY IN PATIENTS WITH DISEASES OF THE DIGESTIVE SYSTEM. Ta'lim innovatsiyasi va integratsiyasi, 31(2), 162-171.
7. Alisherovna, K. M., Rustamovich, T. D., & Baxtiyorovich, U. J. (2022). The Use of Trimetazidine in Patients with Type 2 Diabetes Mellitus Who Have Suffered a Myocardial Infarction. Czech Journal of Multidisciplinary Innovations, 10, 35-41.
8. Alisherovna, K. M., Rustamovich, T. D., Baxtiyorovich, U. J., & Sobirovna, S. M. (2022). Diabetes Mellitus and Hyperglycemia in Patients with Rheumatoid Arthritis. Texas Journal of Medical Science, 13, 99-103.
9. Bakhtiyorovich, U. J. (2024). FEATURES OF THE COGNITIVE STATUS IN WOMEN WITH IRON DEFICIENCY ANEMIA. Spectrum Journal of Innovation, Reforms and Development, 24, 27-32.
10. Bakhtiyorovich, U. J. (2024). METABOLISM REGULATOR IN PATIENTS WITH CHRONIC HEART FAILURE AND ANEMIA OF CHRONIC DISEASES. Journal of new century innovations, 45(3), 3-12.
11. Bakhtiyorovich, U. J., & Buribayevich, N. M. (2024). MENTAL DISORDERS IN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS. International journal of medical sciences, 4(05), 232-239.
12. Bakhtiyorovich, U. J., & Buribayevich, N. M. (2024). PSYCHOSOMATIC RELATIONSHIPS IN PATIENTS WITH EARLY RHEUMATOID ARTHRITIS. International journal of medical sciences, 4(05), 225-231.
13. Baxtiyorovich, U. J., Alisherovna, K. M., & Mamasoliyevna, D. N. (2023). Features of cognitive impairment in patients with chronic kidney disease at predialysis stages. World Bulletin of Public Health, 22, 49-54.
14. Buribayevich, N. M. (2024). DIABETES MELLITUS with ARTERIAL HYPERTENSION. Journal of new century innovations, 45(3), 20-27.
15. Buribayevich, N. M. (2024). THE PSYCHOEMOTIONAL STATUS OF ELDERLY PATIENTS WITH HYPERTENSION AND DIABETES MELLITUS. Spectrum Journal of Innovation, Reforms and Development, 24, 33-38.
16. Buribayevich, N. M., & Bakhtiyorovich, U. J. (2024). VENTRICULAR ARRHYTHMIAS IN HEART FAILURE IN PATIENTS WITH TYPE 2 DIABETES MELLITUS. International journal of medical sciences, 4(05), 240-248.
17. Buribayevich, N. M., & Tatlibayevich, Y. S. (2023). QUALITY OF LIFE OF PATIENTS WITH DIABETES MELLITUS. World Bulletin of Public Health, 27, 48-52.
18. Djamshedovna, K. D., Alisherovna, K. M., & Islomovich, S. I. (2024). ARTERIAL HYPERTENSION IN RHEUMATOID ARTHRITIS. Ta'lim innovatsiyasi va integratsiyasi, 31(2), 139-145.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

19. Erkinovna, K. Z., Alisherovna, K. M., Bakhtiyorovich, U. J., & Djamshedovna, K. D. (2023). METABOLIC SYNDROME IN RHEUMATOID ARTHRITIS. Journal of new century innovations, 38(2), 203-211.
20. Hamraeva, N. A., Sultonov, I. I., & Hasanov, F. S. (2020). Systemic lupus erythematosus treatment strategy. Journal of Critical Reviews, 7(9), 269-270.
21. Ilkhom, S. (2023). CAJAM–VOLUME 1. ISSUE 1. 2023. Central Asian Journal of Advanced Medicine, 1(01), 16-19.
22. Islomovich, S. I. (2024). FEATURES OF THE COURSE OF PREGNANCY IN RHEUMATOID ARTHRITIS. International journal of medical sciences, 4(10), 77-84.
23. Islomovich, S. I. (2024). GENDER CHARACTERISTICS OF THE CURRENT RHEUMATOID ARTHRITIS. International journal of medical sciences, 4(10), 3-8.
24. Islomovich, S. I., Alisherovna, K. M., & Djamshedovna, K. D. (2024). FACTORS OF OSTEOPOROSIS IN PATIENTS WITH CORONARY HEART DISEASE IN COMBINATION WITH RHEUMATOID ARTHRITIS. Ta'lim innovatsiyasi va integratsiyasi, 31(2), 132-138.
25. Khabibovna, Y. S., Alisherovna, K. M., Tashtemirovna, E. M. M., & Baxtiyorovich, U. J. (2023). THE EFFECTIVENESS OF THYROSTATICS IN THE TREATMENT OF. Journal of new century innovations, 29(1), 79-88.
26. Khabibovna, Y. S., Alisherovna, K. M., Tashtemirovna, E. M. M., Totlibayevich, Y. S., Nizamitdinovich, K. S., & Baxtiyorovich, U. J. (2023). DIAGNOSTIC VALUE OF CYSTATIN C IN PATIENTS WITH HYPERTENSION AND OBESITY. World Bulletin of Public Health, 22, 55-59.
27. Khaydarov, S. N., Khusainova, M. A., Uzokov, J. B., & Makhmudova, K. D. (2023). Heart failure and the risk of hypoglycemia. Science and Education, 4(5), 222-231.
28. Khusainova, M. A., Gafforov, K. K., Uzokov, J. B., & Tairova, Z. K. (2023). THE CHANGE IN THE QT INTERVAL IS A MARKER OF THE SEVERITY OF LIVER CIRRHOSIS. Oriental renaissance: Innovative, educational, natural and social sciences, 3(2), 94-101.
29. Khusainova, M. A., Khaydarov, S. N., Uzokov, J. B., & Karabayeva, G. K. (2023). KIDNEY CONDITION IN PATIENTS WITH CHRONIC HEART FAILURE. Oriental renaissance: Innovative, educational, natural and social sciences, 3(2), 102-112.
30. Khusainova, M. A., Khaydarov, S. N., Uzokov, J. B., & Shonazarova, N. K. (2023). QUALITY OF LIFE IN PATIENTS WITH CHOLELITHIASIS IN THE LONG-TERM PERIOD AFTER CHOLECYSTECTOMY. Oriental renaissance: Innovative, educational, natural and social sciences, 3(2), 231-239.
31. Kireev, V. V., & Sultonov, I. I. (2021). Genetic Engineered Preparations-An Innovative Approach in the Treatment of Rheumatoid Arthritis. Annals of the Romanian Society for Cell Biology, 4114-4119.
32. Nizamitdinovich, K. S., Alisherovna, K. M., & Islomovich, S. I. (2024). CLINICAL COURSE OF BRONCHIAL ASTHMA IN PATIENTS WITH THYROID DISEASES. Ta'lim innovatsiyasi va integratsiyasi, 31(2), 181-187.
33. Rustamovich, T. D., Alisherovna, K. M., Baxtiyorovich, U. J., & Abdurakhmonovich, M. M. (2022). Painless Cardiac Ischemia in Women with Rheumatoid Arthritis. Texas Journal of Medical Science, 13, 95-98.
34. Sultonov, I. I., Kh, Z. S., Ruzybakieva, M. R., Kireev, V. V., Aripova, T. U., & Suyarov, A. A. (2021). Pharmacogenetic Aspects of Drug Resistance in Rheumatoid Arthritis. Annals of the Romanian Society for Cell Biology, 4147-4150.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

35. Sultonov, I. I., Khamrayev, X. X., & Xasanov, F. SYSTEMIC LUPUS ERYTHEMATOSUS AND CARDIOVASCULAR PATHOLOGY: WHERE WE AT?.
36. Sultonov, I. I., Xasanov, F. S., Eshmuratov, S., Uralov, R. S., Shukurova, D., & Ziyadullayev, S. X. Predictors of Systemic Lupus Erythematosus: A Case-control Study. International journal of health sciences, 6(S10), 175-182.
37. Tatlibayevich, Y. S., & Buribayevich, N. M. (2023). FEATURES OF THE QUALITY OF LIFE IN PATIENTS WITH PNEUMONIA. World Bulletin of Public Health, 27, 53-57.
38. Tatlibayevich, Y. S., & Buribayevich, N. M. (2023). Study of Clinical and Laboratory Features of Rheumatoid Arthritis. Miasto Przyszłości, 40, 433-437.
39. Uzokov, J. B., Khusainova, M. A., Bekmuradova, M. S., & Makhmudova, K. D. (2023). Dynamics of quality of life indicators during personalized rehabilitation of patients with rheumatoid arthritis with arterial hypertension. Science and Education, 4(5), 196-204.
40. Uzokov, J. B., Khusainova, M. A., Eshmamatova, F. B., & Mamadiyorova, M. M. (2023). Correction of violations rheology of blood in ischemic heart disease. Science and Education, 4(2), 153-159.
41. Xasanov, F. S., & Sultonov, I. I. (2023). RHEUMATOID ARTHRITIS TREATED WITH DMARDS AND CARDIOVASCULAR DISEASE RISK. Oriental Journal of Medicine and Pharmacology, 3(02), 45-52.
42. Ziyadullaev, S. K., Sultonov, I. I., Dushanova, G. A., & Akbarovna, K. S. (2021). The Effectiveness Of Pharmacotherapy For Dmards With Ra Depending On The C3435t Polymorphism Of The Mdr1 Gene. Int. J. of Aquatic Science, 12(3), 2908-2916.
43. Иргашева, У. З., Султонов, И. И., & Тоиров, Д. Р. (2013). Признаки дебюта системной красной волчанки. Академический журнал Западной Сибири, 9(1), 15-15.
44. Тоиров, А. Э., Султонов, И. И., & Тоиров, Э. С. (2020). ЗНАЧЕНИЕ ДИСФУНКЦИИ ПОЧЕК У БОЛЬНЫХ ОСТРЫМ ИНФАРКТОМ МИОКАРДА НА ФОНЕ САХАРНОГО ДИАБЕТА 2-ГО ТИПА. Вестник науки и образования, (9-3 (87)), 86-91.
45. Хамраева, Н. А., Султонов, И. И., & Хасанов, Ф. Ш. У. (2019). Кожные проявления у больных системной красной волчанкой. Вопросы науки и образования, (28 (77)), 128-131.