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CLINICAL OUTCOMES OF MEXIDOL THERAPY IN COMORBID PATIENTS WITH HYPERTENSION, TYPE 2 DIABETES, AND MICROALBUMINURIA

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Abstract: Comorbid arterial hypertension and type 2 diabetes mellitus are frequently accompanied by cognitive impairment, reduced quality of life, and early renal dysfunction associated with microalbuminuria. This study evaluated the effects of adjunctive Mexidol therapy on cognitive performance, quality of life, anxiety, and kidney function during a ten-week treatment period. Clinical outcomes were assessed using the MoCA, SF-36, MLHFQ, KCCQ, MFI-20, and Beck Anxiety Scale together with laboratory markers of renal function. Patients receiving Mexidol demonstrated significantly greater improvements in cognitive status, quality-of-life scores, anxiety reduction, and renal functional parameters than those receiving standard therapy alone. These findings support the inclusion of Mexidol in comprehensive management of high-risk cardiometabolic patients.

Keywords: arterial hypertension; type 2 diabetes mellitus; microalbuminuria; cognitive impairment; quality of life.

КЛИНИЧЕСКИЕ РЕЗУЛЬТАТЫ ТЕРАПИИ МЕКСИДОЛОМ У КОМОРБИДНЫХ ПАЦИЕНТОВ С АРТЕРИАЛЬНОЙ ГИПЕРТЕНЗИЕЙ, САХАРНЫМ ДИАБЕТОМ 2-ГО ТИПА И МИКРОАЛЬБУМИНУРИЕЙ

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Аннотация: Коморбидное сочетание артериальной гипертензии и сахарного диабета 2-го типа часто сопровождается когнитивными нарушениями, снижением качества жизни и ранними признаками поражения почек,

связанными с микроальбуминурией. В исследовании оценено влияние дополнительной терапии Мексидолом на когнитивные функции, качество жизни, уровень тревожности и показатели функции почек в течение десятинедельного лечения. Эффективность терапии определяли с использованием шкалы MoCA, опросников SF-36, MLHFQ, KCCQ, шкалы MFI-20, шкалы тревоги Бека и лабораторных показателей функции почек. У пациентов, получавших Мексидол, отмечено более выраженное улучшение когнитивного статуса, качества жизни, снижение тревожности и улучшение почечной функции по сравнению со стандартной терапией. Полученные результаты подтверждают целесообразность включения Мексидола в комплексное лечение пациентов высокого кардиометаболического риска.

Ключевые слова: артериальная гипертензия; сахарный диабет 2-го типа; микроальбуминурия; когнитивные нарушения; качество жизни.

Introduction: Arterial hypertension and type 2 diabetes mellitus are among the most prevalent chronic diseases and frequently coexist in the same patient, substantially increasing cardiovascular and renal risk. The development of microalbuminuria reflects early renal injury and generalized endothelial dysfunction, while long-standing metabolic disturbances contribute to progressive cognitive decline and deterioration of health-related quality of life. Although standard antihypertensive and glucose-lowering therapy effectively controls the primary disease, many patients continue to experience memory impairment, reduced concentration, chronic fatigue, anxiety, and limitations in everyday activities. Consequently, comprehensive evaluation of cognitive status and patient-reported quality of life has become an important component of modern management for individuals with cardiometabolic comorbidity. Standardized instruments, including the Montreal Cognitive Assessment (MoCA), SF-36, Kansas City Cardiomyopathy Questionnaire, Minnesota Living with Heart Failure Questionnaire, Multidimensional Fatigue Inventory, and Beck Anxiety Inventory, provide objective assessment of physical, psychological, and social functioning. Early identification of cognitive and emotional disturbances may facilitate

individualized treatment strategies and improve long-term clinical outcomes. Therefore, combining conventional medical therapy with agents possessing antioxidant and neuroprotective properties may represent an effective approach for improving functional status, preserving renal function, and enhancing overall quality of life in patients with arterial hypertension, type 2 diabetes mellitus, and microalbuminuria.

Aim of the study: To evaluate the influence of adjunctive Mexidol therapy on cognitive function, health-related quality of life, anxiety level, fatigue, and renal functional parameters in patients with arterial hypertension, type 2 diabetes mellitus, and microalbuminuria receiving standard treatment.

Materials and methods. The prospective study included 40 patients with arterial hypertension, type 2 diabetes mellitus, and confirmed microalbuminuria. Participants were randomly divided into two equal groups. The control group (20 patients) received standard antihypertensive, antidiabetic, and nephroprotective therapy according to current clinical recommendations. The main group (20 patients) received identical treatment supplemented with intravenous Mexidol 500 mg daily for 10 days, followed by oral administration of 250 mg three times daily for the next 60 days. The total duration of follow-up was 10 weeks. Cognitive function was assessed using the Montreal Cognitive Assessment (MoCA). Health-related quality of life was evaluated using the SF-36 questionnaire together with the Minnesota Living with Heart Failure Questionnaire (MLHFQ) and the Kansas City Cardiomyopathy Questionnaire (KCCQ). Fatigue severity was determined using the Multidimensional Fatigue Inventory (MFI-20), whereas anxiety was assessed using the Beck Anxiety Inventory. Renal function was evaluated by urinary albumin excretion, estimated glomerular filtration rate, and serum creatinine concentration. Statistical analysis was performed using Student's t-test and non-parametric methods where appropriate. Differences were considered statistically significant at $p < 0.05$.

Results. After 10 weeks of treatment, patients receiving adjunctive Mexidol demonstrated significantly greater clinical improvement than those treated with

standard therapy alone. The mean MoCA score increased from 23.4 ± 2.1 to 27.1 ± 1.8 points in the Mexidol group, whereas only minor improvement was observed in the control group. SF-36 analysis demonstrated significant enhancement of physical functioning, vitality, emotional well-being, and social activity. MLHFQ and KCCQ scores also indicated better functional capacity and improved perception of health status among patients receiving combination therapy. Fatigue severity measured by the MFI-20 decreased significantly, accompanied by a marked reduction in Beck Anxiety Inventory scores. Renal assessment demonstrated a significant decrease in urinary albumin excretion together with stabilization of estimated glomerular filtration rate, indicating improvement of early renal dysfunction. Serum creatinine remained stable throughout the observation period. Comparative analysis confirmed that cognitive performance, psychoemotional status, and quality-of-life indicators improved more markedly in the Mexidol group than in patients receiving conventional treatment alone. These findings suggest that adjunctive antioxidant therapy may positively influence both neurological and renal outcomes in high-risk cardiometabolic patients while improving their overall functional status and daily quality of life.

Conclusions: Adjunctive Mexidol therapy significantly improved cognitive performance, psychoemotional status, health-related quality of life, and renal functional parameters in patients with arterial hypertension, type 2 diabetes mellitus, and microalbuminuria. Combined treatment demonstrated superior clinical effectiveness compared with standard therapy alone and was associated with reduced anxiety, lower fatigue severity, and better patient-reported outcomes. Comprehensive assessment using standardized cognitive, psychological, and quality-of-life instruments provides valuable information for individualized treatment planning and may contribute to improved long-term management of patients with complex cardiometabolic disease.

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