

25<sup>th</sup> Global

# DIABETES SUMMIT AND MEDICARE EXPO

December 04-05, 2017 Dubai, UAE



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### Diabetes mellitus and Parkinson's disease: Comorbidity and prospects of complex therapy

Parkinson's disease (PD) is widespread around the globe. Impacts of diabetes mellitus on PD are non-clear and non-evaluated. 66 patients were included this study (43 female, 23 male, average age  $68 \pm 0.49$ ). 10 patients have diabetes mellitus as comorbid diagnosis. There were 2 groups: (1) Patients without external brain stimulation and (2) Patients with external brain stimulation. Patients used smartphones for external brain stimulation. 76% of patients had akinetic-rigid-tremor type of disease, 18% had akinetic-rigid type, 1% had tremor type, 7% had rigid-tremor type. According to Hoehn-Yahr scale, 1% of patients had the first stage of disease, 17% had the second stage, 74% had the third stage and 8% had the fourth stage. According to MoCa testing results: average score in 1 group before treatment was  $22.8 \pm 0.78$ , after therapy  $25.1 \pm 0.76$  ( $p < 0.05$ ), in 2 group  $23.3 \pm 0.98$  and  $26.9 \pm 0.97$  ( $p < 0.05$ ). According to HADS testing results: Average score of anxiety level in 1 group before treatment was  $11.4 \pm 0.65$  after therapy  $9.1 \pm 0.68$  ( $p < 0.05$ ), in 2 group  $10.8 \pm 0.86$  and  $7.6 \pm 0.88$  ( $p < 0.05$ ). Average score of depression in 1 group before treatment was  $9.8 \pm 0.66$ , after therapy  $9.5 \pm 0.68$  ( $p > 0.05$ ), in 2 group  $10.8 \pm 0.75$  and  $9.8 \pm 0.72$  ( $p > 0.05$ ). 81.2% of patients had anxiety syndrome, 66.4% of patients had depression syndrome. According to vegetative disturbance scale: Average score in 1 group before treatment was  $2.3 \pm 0.23$ , after therapy  $2.2 \pm 0.25$  ( $p > 0.05$ ), in 2 group  $2.3 \pm 0.24$  and  $2.1 \pm 0.24$  ( $p > 0.05$ ). According to UPDRS average score in 1 group before treatment was  $53.5 \pm 0.72$ , after therapy  $48.3 \pm 0.73$  ( $p < 0.01$ ), in 2 group  $54.2 \pm 0.88$  and  $45.3 \pm 0.87$  ( $p < 0.01$ ). Obtained data shown efficiency of complex therapy with external brain stimulation for motor disorders, cognitive and emotional impairments in cases of comorbidity of Parkinson's disease and diabetes mellitus.

#### Recent Publications

1. Vasiliev Y N, Simakova E P, Bykov Yu N (2017) Diagnostics and treatment of orphans disease—Fabry disease. *Siberian Medical Journal (Irkutsk)*; 1: 54-56.
2. Laletin V S, Bikov Yu N (2015) General Anesthetics as a Factor of the Effective Neuroprotection in Ischemic Stroke Models. *Biochemistry (Moscow) Supplement Series B: Biomedical Chemistry*; 9(1): 1-9.

#### Biography

Yury N Bykov has completed his PhD from Irkutsk State Medical University and Postdoctoral studies from Department of Clinical Neurology at the University Hospital of Vienna, in 2001 and 2008, respectively. He is the Head of Neurology Department at Irkutsk State Medical University and Post of Vice-Rector of the ISMU. He has published more than 100 papers in reputed journals and has been serving as an Editorial Board Member of *Siberian Medical Journal*.

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