59.15 [33.6; 127.3] pg / ml. The serum PTH concentration in a multiglandular lesion 30 minutes before surgery was 360.0 [342.4; 1000] pg / ml, with a significant decrease 20 minutes after removal of the glands to 232.0 [185.5; 510.0] pg / ml. In the control group, the level of blood PTH in the preoperative period was 40.0 [26.0; 59.0] pg / ml, and after thyroidectomy – 38.0 [21.0; 54.0] pg / ml, without statistically significant differences. The median of the concentration of PTH in the flush during puncture biopsy of the parathyroid glands was 2380 [703.0; 15018.0] pg / ml. We found that the median values of the concentration of PTH in the flush during puncture of the parathyroid gland in the hyperparathyroid state was 11097.0 [4257.0; 28000.0] pg / ml, and with puncture of unchanged parathyroid glands – 579.0 [388.0; 1467.0] pg / ml. The median level of PTH in the flush with a puncture needle in the study in the first group of patients was 11471.0 [4257.0; 28229.0], and in the second 8961.0 [8932.0; 18504.0]. Using ROC analysis, it was found that the cut-off point of the PTH concentration is at the level of 2380 pg / ml (AUC = 0.98; SE = 0.013). As a result of the study, "excellent" diagnostic capabilities of the proposed method of intraoperative differential diagnosis of an intact and visually unchanged thyroid gland in a hyperparathyroidism state were detected, the sensitivity of which was 100%, specificity – 91.8%.

Prospects for further research. Intraoperative differential diagnosis of adenoma and hyperplastic parathyroid gland by studying the level of parathyroid hormone in punctate.

References:

1. **Dedov I.I., Melnichenko G.A. , Fadeev V.V. Endocrinology, 2015. - 425s.**
2. **Primary hyperparathyroidism as one of the common endocrinopathies in the Republic. F. Zhdanova, N.V. Gerasimovich O. Zhdanova, N. Gerasimovich.Belarusian State University, Moscow State Institute of Economics A. D. Sakharov BSU.**
3. **Jessica, R. Management of Primary Hyperparathyroidism. Thyroid and Parathyroid Diseases- New Insights into Some Old and Some New Issues / R. Jessica, A. Marlon. - Guerrero Department of Surgery; University of Arizona, Tucson, Arizona USA, 2012. - 203-220 p.**

Key words: *biopsy, parathyroid glands, parathyroid hormone, diagnostics.*

DOI: 10.29256/v.03.01.2019.escbm81

DOES A-SYNUCLEIN LEVEL IN BIOLOGICAL FLUIDS CORRELATE WITH SEVERITY OF COGNITIVE IMPAIRMENT IN PATIENTS WITH PARKINSON'S DISEASE? (REVIEW)

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There are many investigations about the role of a-synuclein as a possible biomarker of Parkinson's disease (PD). The majority of researches consists data about the level of a-synuclein and its oligomers in patients with different stages of PD. One of the latest meta-analysis of 10 publications about a-synuclein level in total 1302 participants, performed by Bougea A. et al. [4], showed that total plasma a-synuclein levels were higher in PD patients than controls. As a-synuclein level can be considered as possible biomarker of PD, it is necessary to investigate correlations of its level in different human biological fluids with specific motor and non-motor symptoms of the disease on its different stages and to research any influences of its level on the speed of the development of these symptoms. One of the most important non-motor symptoms of PD is cognitive impairment, which is significantly worsening the quality of patient's life. But there are only few studies about connection between a-synuclein level in human biological fluids

and severity of cognitive impairment in patients with PD. Stav A.L. et al. [1] found out that 31 early, non-dementia PD patients had significally lower cerebrospinal fluid level of total a-synuclein compared to normal controls and only lower Aβ42 was associated with reduced cognitive functions in early PD. Kang J.H. et al [2] research showed that in a multivariate regression model, lower a-synuclein level was significantly associated with worse cognitive test performance. Lin C.H. et al. [6] examined 80 patients with PD and found out that plasma a-synuclein levels were significantly higher in PD patients with dementia than in PD patients with mild cognitive impairment or normal cognition and were negatively correlated with Mini-Mental State Examination scores. Results of H.Wang et al. study [5] suggest that alterations in plasma total concentrations are likely associated with PD progression, especially in the aspect of cognitive impairment, at early stages of the disease. In turn, according to the results of T.Schirinzi et al. investigation [3], there were significant correlations between a-synuclein level and either item 3 or 9 of Non Motor Symptoms Scale (NMSS), assessing mood/cognition and pain/smell/weight/ sweating respectively, which in author's opinion indicate a prominent impairment of neural networks controlling these functions.

Conclusion. The results of researches are quite controversial and require further investigations. As it is necessary to determine the possibility of potential cognitive impairments in patients with PD, the ways of solving this problem should be more safe and easy in performing. It may need to concentrate on the investigations of plasma levels of a-synuclein in patients with PD with the onset of the disease with further control through the determined period of time. Also it seems to be needed to examine cognitive functions of the patients with PD with specific tests, that may cover more options of higher psychic functions and to control the results by proper neurophysiological methods. The prospects for further researches may include studying of changings of a-synuclein plasma total concentrations in patients with cognitive impairment in early stages of PD and examining their cognitive functions with cognitive screening tests and cognitive evoked potentials as well.

References.

1. **Amyloid-β and a-synuclein cerebrospinal fluid biomarkers and cognition in early Parkinson's disease / A.L. Stav, D. Aarsland, K.K. Johansen // Parkinsonism Relat Disord. – 2015. – Vol. 21 (7). – P. 758-764.**
2. **CSF biomarkers associated with disease heterogeneity in early Parkinson's disease: the Parkinson's Progression Markers Initiative study / J.-H. Kang, B. Mollenhauer, C.S. Coffey [et al.] // Acta Neuropathol. – 2016. – Vol.131. – P. 935-949.**
3. **CSF a-synuclein inversely correlates with non-motor symptoms in a cohort of PD patients / T. Schirinzi, G. M. Sancesario, G. Di Lazzaro [et al.] // Parkinsonism Relat Disord. – 2019. – Vol. 61. – P. 203-206.**
4. **Plasma alpha-synuclein levels in patients with Parkinson's disease: a systematic review and meta-analysis / A. Bougea, L. Stefanis, G.P. Paraskevas [et al.] // Neurol Sci. – 2019. – Vol. 40 (5). – P. 929-938.**
5. **Plasma a-synuclein and cognitive impairment in the Parkinson's Associated Risk Syndrome: A pilot study / H. Wang, A. Atik, T. Stewart [et al.] // Neurobiol Dis. – 2018. – Vol. 116. – P. 53-59.**
6. **Plasma a-synuclein predicts cognitive decline in Parkinson's disease / C.H. Lin, S.Y. Yang, H.E. Horng [et al.] // J Neurol Neurosurg Psychiatry. – 2017. – Vol. 88 (10). – P. 818-824.**

Key words: *a-synuclein, Parkinson's, cognitive, cognitive evoked potentials, plasma.*