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Both the administration of the food additive «SpiruCr1» and of the biopreparation «BioR^{Cr1}» have induced an increase of insulin activity by 1.44-1.56 times in comparison with control group (healthy rats). We supposed that this fact is due to chromium involvement in the process of increasing insulin activity. Chromium can be part of some oligopeptides–chromodulins–potentiating the effect of insulin by facilitating insulin binding to the cell surface receptors. Thus, the result of research was demonstrated the ability of the chromium containing preparations - «SpiruCr1» and «BioR^{Cr1}» - to stimulate insulin activity.

The prospects for further research. The obtained results demonstrate the positive effect of the chromium-containing bioadditives from spirulina - «SpiruCr1» and «BioR^{Cr1}» on insulin activity in rats. Natural chromium containing preparations obtained by biological synthesis can supplement or substitute synthetic chromium containing food additive with similar action. Further clinical and preclinical investigations are required.

Referinces:

1. **Pechova A., Pavlata L. Chromium as an essential nutrient: a review. Veterinarni Medicina, 2007, Vol.52, no.1, p. 1–18.**
2. **Stout M.D., Nyska A., Collins B.J. et al. Chronic toxicity and carcinogenicity studies of chromium picolinate monohydrate administered in feed to F344/N rats and B6C3F1 mice for 2 years. In: Food Chem. Toxicol, 2009, Vol.47, p.729-733.**
3. **Wani S., Weskamp C., Marple J., Spry L. Acute tubular necrosis associated with chromium picolinate containing dietary supplement. In: The Annals of Pharmacotherapy, 2006, vol.40, no.3, p.563-566.**
4. **Chatterjee N., Luo Z., Malghani S., Lian J. J. Zheng W. L. Uptake and distribution of chromium in Saccharomyces cerevisae exposed to Cr(III)-organic compounds. Chemical Speciation and Bioavailability, 2009, vol.21, no.4, p.245-255**
5. **Ciumac D. Studiul modificării componenței biochimice a cianobacteriei Spirulina platensis la cultivare în prezența compuşilor coordinativi ai Cr(III):Autoreferat al tezei de doctor, 2008, p.83-84. //CIUMAC, D. Study of the modification of the biochemical composition of Spirulina platensis cyanobacteria in cultivation in the presence of coordinative compounds of Cr (III): Dissertation Abstracts, 2008, p.83-84.**
6. **Rudic V. et al. Ficobiotehnologie, cercetări fundamentale şi realizări practice. Chişinău: S.n., Tipogr. „Elena V.I." SRL, 2007. 365 p. // RUDIC, V. Phiobiotechnology, fundamental research and practical achievements. Chişinău: S.n., Tipogr. „Elena V.I." SRL, 2007. 365 p.**
7. **Belokobylsky A., Ginturi E., Kuchava N. et al Accumulation of selenium and chromium in the growth dynamics of** *Spirulina platensis.* **In: Journal of Radioanalytical and Nuclear Chemistry, 2004, vol.259, no.1, p.65-68.**
8. **Bulimaga V., Zosim L., Elenciuc D. Perspectiva de utilizare a glicinatului de Cr(III) pentru obținerea biomasei de spirulină îmbogățită cu crom – sursă de produse antidiabetice. Studia Universitatis seria „Științe ale naturii", 2015, no.6 (86), p.3-8. // Bulimaga V., Zosim L., Elenciuc D. Perspective of Cr (III) glycinate application for the production of chromium-enriched spirulina biomass - source of antidiabetic products. . Studia Universitatis seria** *„Life sciences",* **2015, no.6 (86), p.3-8.**

Key words: Spirulina platensis, chromium containing preparations, insulin activity, type II diabetes.

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ANHEDONIA AS BEHAVIORAL MARKER OF EXPERIMENTAL NEUROSIS AND ITS CORRECTION

Sydorenko A.H., Lutsenko R.V.
Ukrainian Medical Stomatological Academy, Ukraine

Anxious and depressive disorders are widespread nowadays. Number of people who suffer from depression and anxiety permanently increases, in particular, in 2017 about 350 million had depressive disorders and about 260 millions – anxious disorders. Anhedonia is the leading symptom of neurosis, depression, schizophrenia, depersonalization, Parkinson's disease [1]. Inability to feel pleasure during such abnormal conditions has various character, especially at depressive disorders – positive emotions are not long-lasting which do not ease the patient [2]. The decrease of anhedonia symptoms can define the efficacy of the treatment of such ailments. The aim of the investigation is to investigate indices of anhedonia after experimental neurosis in rats based on the derivative of 2-oxoindoline-3-glyoxylic acid (substance 18).

Materials and Methods. Materials and methods of investigation: experiments are done on rats of Wistar line with body weight 180-230 gr. Animals were kept on traditional nutritional, water and 12-hour light regimen. In order to correct neurosis, derivative of 2-oxoindoline was used. The substance, which was investigated, was taken in 12 mg/kg inside per 1 hour before beginning of stressors influence and every 3 hours during the whole period of neurotization. Chronic neurosis was done by «conflict of afferent activators**»** during 30 days [3]. Diazepam (2 mg/kg) was used by analogical method. Changes of behavior of animals were investigated in the test «sucrose consumption» and in the test sucrose consumption advantage (this test means such action: one bottle of water, one bottle of sugar). The processing of received results was done by Microsoft Statistics 6.0 using criterion t Student.

Results. Based on neurosis, there is decrease of the number of arriving to drinking-bowl in 1,9 times ($p<0,001$) and decrease of the total number of drunk sucrose in 2,2 times ($p<0,001$) and decrease of the percentage of drunk water with sugar in the test sucrose consumption advantage in comparison with intact animals. Diazepam after 4

weeks increased the number of arriving to drinking-bowl in 1,4 times (p<0,02), and possibly increased the number of drunk sucrose and percentage of consumed sugar to total number of liquid with experimental pathology. Preventive and therapeutic use of derivative 2-oxoindoline 18 effectively countered anhedonia, and increase of the number of arriving to drinking-bowl with sucrose 1,4 times (p<0,02) and increase of drunk sucrose 1,3 times (p<0,02) in comparison with control pathology without correction. Also, substance 18 assisted in the advantage of sucrose solution.

Also, during experimental neurosis in the test sucrose consumption advantage, the percentage of drunk water with sugar in comparison with control group was decreased. After 4 weeks of neurosis, diazepam intake increased the number of arriving to drinking-bowl in 1,4 times (p<0,02), and possibly increased the number of drunk sucrose and percentage of consumed sugar to total number of liquid in comparison with such during experimental pathology. Preventive and therapeutic use of amide of 2-oxoindoline-3-glyoxylic acid with substance 18 after 4 weeks of neurosis modeling effectively withstood anhedonia. During this period the substance possibly assists in the advantage of sucrose among water.

So, experimental neurosis is accompanied with the development of typical emotional and behavioral disorders (decrease of quantative and qualitative indices of sucrose consumption). Preventive and therapeutic use of amide of 2-oxoindoline-3-glyoxylic acid effectively corrected the development of taste disorders in sucrose consumption and it didn't exceed diazepam.

Experimental neurosis caused the development of anhedonia. Therapeutic and preventive use of the substance 18 effectively decreased the manifestations of anhedonia after experimental neurosis in rats. Such results can be essential for further investigation of monoaminergic mechanisms of the derivatives of 2-oxoindoline-3-glyoxylic acid during neurotic pathology in animals.

References:

1. **Kellera J., Youngb Ch.B., Kelleya E., Prater K., Levitin D.J., Menon V. Trait anhedonia is associated with reduced reactivity and connectivity of mesolimbic and paralimbic reward pathways. Journal of psychiatric research 2013; 47 (10): 1319–1328.**
2. **Vriezea E., Demyttenaerea K., Bruffaertsa R., Hermansb D., Pizzagalli D.A., Sienaert P., Hompes T., Boer P., Schmidt M., Claes S. Dimensions in major depressive disorder and their relevance for treatment outcome. Journal of Affective Disorders 2014; 155: 35–41.**
3. **Vedyaev F.P. Modeli i mechanizmy neyrogennogo stressa. Zhurnal vysshey nervnoy deyatel'nosti 1977; 27(2): 325–327.**

Key words: derivative of 2-oxoindoline-3-glyoxylic acid, rats, experimental neurosis.

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RELIABILITY OF URINE AS SOURCE FOR BIOLOGICAL INFORMATION FOR RISK ESTIMATION FOR PROSTATE MALIGNANCY

Ramić Jasmin[1], Kulovac Benjamin[2], Lojo Kadrić Naida[1], Hadžić Maida[1], Eminagić Đenana[2], Pojskić Lejla[1]
1-Laboratory for human genetics, Institute for genetic engineering and biotechnology, Sarajevo,BiH
2-Urology Clinic, University Clinical Centre Sarajevo, Sarajevo,BiH

Prostate diseases, including prostatitis, benign prostatic hyperplasia and carcinoma are some of the most common diseases that occur in mainly Caucasian men after fifty years of age. All of these diseases are characterized by similar symptoms, such as frequent urge to urinate, intermittent urination, incomplete urination, increased frequency of nocturnal urinating and erectile dysfunction. Because of similar symptoms between benign prostatic hyperplasia and various different types of cancer precise diagnostic is based on the biopsy of prostate tissues and its result. In practice, the diagnostic screening starts from the serologic analyses, and digital rectal examination. Digital rectal examination is informative for detection of the enlargement of the prostate. Blood tests include determination of PSA (Prostate Specific Antigen) concentration. Conventional screening and diagnostic procedures in prostate diagnostics rely on elevated PSA concentration which is not specific only for prostate cancer (Hessels et al. 2003) and frequently leads to unnecessary invasive biopsy. It is estimated that approximately 50% of persons who underwent tissue biopsy did so based on false positive PSA value (Rigau et al. 2013). PSA, is also known as Gamma - seminoprotein, which belongs to the kallikrein-related peptidase protein family and is secreted by epithelial cells of the prostate, and has a role in the production of seminal liquid that is secreted during ejaculation and allows spermatozoids to move freely. Genetic precursor of PSA is named kallikrein - 3 or shortened KLK3 gene. Limitations of the biopsy procedure caused further search of the easy noninvasive method for screening and differential diagnostics of prostatic diseases (Mengual et al. 2016; Drake et al. 2009; Bryzgunova et. al. 2015). The aim of the study was to evaluate methods of isolation of total RNA from urine samples and to assess the performance of relative gene expression analysis with such RNA as template using Real time PCR. GAPDH (glyceraldehyde 3 - phosphate dehydrogenase) gene was used as Gene of interest. Also the study was aimed at identification of critical procedural factors associated with the quality and quantity of isolated genetic information.

Materials and methods. Urine samples were collected from a total of 162 participants, patients of the Urology Clinic of CCUS (Clinical Center of University of Sarajevo). The patients underwent standard clinical diagnostic procedures for prostate cancer (transrectal examination, biochemical PSA measurement from blood, needle