

SUMY STATE UNIVERSITY
MEDICAL INSTITUTE



**BIOMEDICAL
PERSPECTIVES**

II

ABSTRACT BOOK

*International Scientific Conference
of Students, Postgraduates and Young Scientists*

(Sumy, October 20-22, 2020)

Sumy
Sumy State University
2020

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PECULIARITIES OF CHANGES IN THE RATIO OF ZN / CU IN THE LUNGS OF YOUNG ANIMALS UNDER CONDITIONS OF EXPERIMENTAL ALLOXAN HYPERGLYCEMIA

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Introduction. It is generally accepted that diabetes is a multifactorial disease caused by insulin resistance and β -cell insufficiency. According to modern scientific research, each pathology has certain deviations in the elemental status. For example, in diabetes, the most common accumulation of zinc, manganese, copper, magnesium in the lungs, liver and other parenchymal organs, which is evidence of oxidative stress reactions.

Aim. Detect and investigate changes in the Zn / Cu ratio in young rats under conditions of experimental hyperglycemia.

Materials and methods. The studies were performed on 72 white laboratory rats of both sexes. Experimental animals were divided into two series: 1) experimental and 2) intact. Each experimental group is divided into six subgroups (6 animals) depending on the duration of the experimental study: the first - with a term of hyperglycemia 30 days, the second - 60 days, the third - 90 days, the fourth - 120 days, the fifth - 150 days, the sixth - 180 days. For experimental simulations of hyperglycemia, alloxan monohydrate was used at a rate of 20 mg per 100 g of rat body weight. Determination of Zn and Cu concentrations in $\mu\text{g} / \text{g}$ was performed on an atomic absorption spectrophotometer C-115.M1 (OJSC "Selmi", Sumy, Ukraine) using a universal certified computer program "AAS SPEKTR".

Results. After administration of alloxan at the end of the first day, animals of all ages developed polydipsia, polyphagia and polyuria. The level of glucose in the blood of experimental animals from 30 to 180 days ranged from 13.1 ± 0.12 to 19.3 ± 0.2 mmol / l, HbA1C - from 7.1 ± 0.05 to 9.39 ± 0.08 . In animals of the intact group, the level of glucose in the blood was within normal limits (blood glucose 3.5 - 6.3 mmol / l, HbA1C 4.0 - 5.1).

The ratio of Zn / Cu in intact animals aged 2 months was 8.5; 3 months - 8.5; 4 months - 8.5; 5 months - 8.53; 6 months - 8.54; 7 months - 8.56. In rats of the appropriate age on the background of hyperglycemia, the ratio of Zn / Cu for 30 days was 16.8; for 60 days - 16.95; for 90 days - 17.1; for 120 days - 17.3; for 150 days - 17.35; for 180 days - 17.3.

Conclusions. The ratio of Zn / Cu increased with increasing duration of diabetes: on the 30th day compared with the control by 95.3% ($p < 0.05$), on the 60th day - by 0.89% ($p < 0.05$), compared with the previous month of the experiment, on the 90th day - by 0.88% ($p < 0.05$), on the 120th day - by 0.29% ($p < 0.05$), and on the 180th day decreased by 0.29% ($p < 0.05$) compared with the 120th day, which indicated an increase in the intensity of antioxidant reactions with increasing duration of hyperglycemia.

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