P30. Influence of bioactive coordination compounds on erythrocyte glutathione system in asthma

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Background: Identification, study and testing of new remedies for the correction of the glutathione system disorders in respiratory diseases, including asthma, are of particular interest due to the increased incidence of this disease and its severity leading to disability in people of working age. An increased interest is manifested for the nonplatinum metal coordination compounds with halogensemicarbazides based chelation and macrolydic ligands which exhibit important bioactive properties [Gulea A et al., 2007, 2009]. But their influence on erythrocyte glutathione system in asthma (BA) has been not studied.

The study **aimed** to elucidate the influence of the new nonplatinum metal coordination compounds on erythrocyte glutathione system *in vitro* in asthma with different severity.

Methods: The research was performed on peripheral blood samples collected from 23 patients diagnosed with persistent BA. The control group consisted of 13 practically healthy persons. Patients were divided into 3 groups according to the severity: I - mild; II - moderate; III - severe form. Nonplatinum metal coordination compounds CMD-4, CMD-8, CMJ-33 and CMJ-23 were tested. Peripheral blood samples was diluted in Dulbecco's modified Eagle's nutrient medium (DMEM) and incubated at 37° C for 24 h with the compounds mentioned above. The erythrocyte reduced glutathione content (GSH), glutathion reductase (GR), glutathion peroxidase (GPO) and glucose-6-phosphate dehydrogenase (G-6-PDH) activity were evaluated.

Results: The research revealed that the tested coordination compounds statistically conclusive increased the GSH content in erythrocytes of BA patients. The highest values were registered after incubation with CMJ-33 (+46% in mild BA, +61% in medium severity BA; +19% in severe BA), and CMJ-23 (+26% in mild BA, +36% in medium severity BA; + 13% in severe BA).

Functional level of GR was increased statistical significantly by CMD-4 (+112%), CMJ-33 (+93%) and CMJ-23 (+118%) compared with controls only in the mild form of BA.

All studied compounds decreased the activity of erythrocyte G-6-PDH in healthy persons compared to baseline, whereas in the patients with BA the enzyme activity increased 6.5 times in the mild form, 4.6 times in the moderate and 2 times in the severe one compared to control values ($p<0.001$).

In mild and moderate forms of BA all tested substances maintained the GPO functionality higher than the control level (34%-70%). In the severe form of the disease the coordination compounds did not induce significant changes in the level GPO of the RBC relative to control.

Conclusions: The results demonstrate the potent modulatory effects of the studied coordination compounds on the glutathione metabolism in BA of varying severity, as confirmed by the increase of the GSH content and GR, G-6-PDH and GPO activity in erythrocytes in the mild form of the disease compared with the levels specific for the healthy individuals. In the moderate and severe forms of BA the tested coordination compounds influence the GPO and G-6-PDH activity, maintaining their values increased compared to the control.

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