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Title: Evaluation of metal ions content in blood serum, erythrocytes and urine of patients with psoriasis associated with arterial hypertension

Oleksandra Havryliuk¹, Alla Bilovol¹, Svitlana Tkachenko¹

¹ Kharkiv National Medical University, Kharkiv, Ukraine

Introduction & Objectives

The postulate comorbidity of psoriasis and arterial hypertension has a metabolic nature probably. Deviation of metabolism of microelements can play the role in pathogenesis of both diseases as well as their comorbidity. The aim of this study was to evaluate of metal ions content in blood serum, erythrocytes and urine of patients with psoriasis associated with arterial hypertension.

Materials and methods

We examined 145 patients, among them 42 patients suffered on psoriasis, associated with arterial hypertension (PAAH group) and 20 healthy persons (control group). Measurement of the concentration of metal ions in serum of blood, erythrocytes of blood and urine was carried out by atomic absorption method.

Results

The accumulation ($p < 0.05$ vs control group) of trace elements in the blood serum of patients PAAH group has been recorded (Na^+ on 29 %; Cu^{2+} on 28 %; Ca^{2+} on 50 %; K^+ on 84 %; Zn^{2+} on 110 %; Fe^{2+} on 146 %) with the exception of Mg^{2+} deficiency on 56 %. Variations of the metal ions level in erythrocytes have shown statistically significant decrease compared with the control group for K^+ (on 15 %), Fe^{2+} (on 26 %), Zn^{2+} (on 17 %). At the same time, there was an increase ($p < 0.05$ vs control group) of Mg^{2+} (on 59 %), Na^+ (on 25 %), Cu^{2+} (on 103 %) and Ca^{2+} (on 80 %) in red blood cells of patients PAAH group. Accumulation ($p < 0.05$ vs control group) in urine of examined patients was registered for Ca^{2+} (on 37 %), K^+ (on 46 %), Zn^{2+} (on 20 %), Fe^{2+} (on 63 %) while the deficiency was registered for of Mg^{2+} (on 21 %), Na^+ (on 81 %), and Cu^{2+} (on 14 %).

Conclusions

An analysis of the content of metal ions in serum, erythrocytes and urine testifies to the profound changes in ionic homeostasis in patients with psoriasis associated with arterial hypertension. The statistically significant accumulation of K^+ , Zn^{2+} , Fe^{2+} in serum and urine accompanied by deficiency in erythrocytes; accumulation of Na^+ and Cu^{2+} in serum and red blood cells - by deficiency in urine. Statistically significant accumulation of Ca^{2+} was found in serum, erythrocytes and urine of patients. Statistically significant deficiency of Mg^{2+} in blood serum and urine of PAAH patients accompanied by accumulation in red cells of blood. Deviations of metal ions metabolism have to be considered in management of patients suffering on psoriasis comorbid with arterial hypertension.

