

## **SERUM LACTATE AND LACTATE DEHYDROGENASE ACTIVITY UNDER EXPERIMENTAL INSULIN RESISTANCE IN RATS**

Kravchenko G.B., Matar Mazen

National University of Pharmacy, Kharkiv, Ukraine

Insulin resistance (IR) – a key factor of diabetes mellitus type 2 (DM2) development and progression – is closely associated with abnormal lactate metabolism. A number of investigations revealed that lactate involved in IR regulation. The herbal supplements as an antidiabetic adjuvants are of interest to scientists because of the diversity of substances they contain.

The aim of this experiment was comparative study of blood serum lactate content and lactate dehydrogenase (LDH) activity under the experimental IR in rats treated with plant origin compounds.

Male inbred rats weighting 190-210 g were randomized into 5 groups: 1- intact animals (IA), 2- animals that during 5 weeks were daily intra-abdominal injected dexamethasone in dose 15 µg/kg (IR); 3- animals with experimental IR that beginning from the 3<sup>rd</sup> week of the experiment were administered intragastrically polyphenol extract obtained from Bearberry leaves (PE, Pharmacognosy Department, NPhU) in dose 100 mg/kg of body weight (IR+PE); 4- animals with experimental IR that beginning from the 3<sup>rd</sup> week of the experiment were administered intragastrically arbutin in dose 3 mg/kg of body weight (IR+A); 5- animals with experimental IR that beginning from the 3<sup>rd</sup> week of the experiment were administered intragastrically. Arphasetin in recommended dose recalculated for rats (IR+Ar). After the end of the experiment in obtained blood serum samples were measured lactate concentration (SPAINLAB CO, Ukraine), total LDH activity and LDH1 activity (NPP “Phyllis-Diagnosis”, Ukraine). The IR development was proved by glucose and immunoreactive insulin (IRI) content.

In our experiment the serum lactate level was significantly higher in IR rats ( $1.7 \pm 0.04$  mmol/l) compared to healthy animals ( $3.2 \pm 0.11$  mmol/l). Reduced synthesis of glycogen as well as glucose oxidation and, on the contrary, increased rate of anaerobic glycolysis, which is typical for IR state, could lead to this accumulation. Whereas, in animals administered studied compounds the lactate content stabilized and varied within a relatively narrow range (IR+PE –  $1.9 \pm 0.06$ ; IR+A –  $2.2 \pm 0.02$ ; IR+Ar –  $2.4 \pm 0.04$  mmol/l) but were significantly lower than the untreated IR rat group.

Interestingly, the data of LDH activity are contradictory. Thus, total serum LDH activity significantly increased in IR animals (in 1.4 times) while LDH1 activity didn't change significantly.

Summarizing up, the study findings revealed that PE from Bearberry leaves might regulate metabolic changes associated with lactate metabolism under the IR.