

action at the condition of acute abdominal pathology and abdominal tuberculosis.

Peripheral blood serum were analyzed with ELISA for concentration of TNF $\alpha$  preoperatively in the patients with acute cholecystitis (AC) (n=50), acute phlegmonous appendicitis (APA) (n=41), abdominal tuberculosis (AT) (n=30) and in 35 healthy people. The types of adaptation reaction were determined by the lymphocyte count in blood formula: less than 20% - SR: 21-27% - OR.

It was shown by the investigation, that in AC level of TNF $\alpha$  in SR was  $15,51 \pm 1,1$  pg/ml, that is 3 times higher ( $p < 0,05$ ) than in healthy people ( $4,97 \pm 0,18$  pg/ml). In AC when the OR the level

of TNF $\alpha$  was  $7,65 \pm 0,5$  pg/ml, that was 2 times lower than in SR and 1,5 times higher than in healthy people ( $p < 0,05$ ). In patients with APA in SR TNF $\alpha$  level was  $21,82 \pm 1,2$  pg/ml and in OR -  $11,83 \pm 1,1$  pg/ml that was 1,8 times lower than in SR ( $p < 0,05$ ). In chronic inflammatory process (AT) in SR TNF $\alpha$  level was  $12,82 \pm 1,0$  pg/ml and in OR -  $6,31 \pm 0,4$  pg/ml that was also 2 times lower than in SR ( $p < 0,05$ ).

Stress reaction is associated with 2 times higher level of TNF $\alpha$  than in orientation reaction. It has been shown that when orientation reaction an immune response is implemented without signs of systemic inflammation.

## IMPACT OF PRENATAL PROGRAMMING ON BROWN ADIPOSE STRESS-RELATED CHANGES IN ADULTHOOD

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Brown adipose tissue (BAT) is most obvious in small mammals and infant humans, but was often believed to be lost postnatally within the first few years of the human life. Recent studies using positron emission tomography have demonstrated that healthy adult humans do possess significant depots of metabolically active BAT. Regarding to its significant capacity to control chemical energy, triglyceride and glucose metabolism, BAT could be a potential target for treatment obesity and metabolic syndrome.

**Aim:** to study the influence of stress and different kinds of high-calorific diet during the prenatal period on adult offspring BAT formation and cytokine activity in experimental animals.

Histomorphological researches of interscapular BAT were estimated in nonlinear rats: control group (intact) and offsprings of mothers which during pregnancy were induced social stress by Pratt N.C., 1989 and following kinds of high-calorific feeding: 1 group - high-calorific diet with chronic introduction of 30% saccharose (by Kozar, 2009); 2 group - high-calorific diet with prevailing of fats (by A. Lintermans, 2009); 3 group - a binary influence of those factors. Serum cytokines was measured using

a GRO/CINC-1 (rat) ELISA kit) and IL-1 $\beta$  (rat), ELISA kit («Enzo Life Sciences», UK).

BAT of the animals from control had an ordinary histological structure and serum cytokines level: GRO/CINC-1 -  $321 \pm 2,85$  pg/ml, IL-1 $\beta$  -  $28,29 \pm 2,06$  pg/ml. In the 1 group plural macrovesicle adipocytes among the multilocular cells of brown fat were revealed; GRO/CINC-1 was greater on 56 %, IL-1 $\beta$  - 100 % vs to control. In the 2 group appeared separate macrovesicle adipocytes; GRO/CINC-1 - greater on 46 %, IL-1 $\beta$  - on 57 % by comparison to control group. In the 3 group appeared areas of macrovesicular cells and leukocytes perivascular infiltration; GRO/CINC-1 - greater on 99 %, IL-1 $\beta$  - on 217 % vs to control.

Brown fat forming is prenatally programmed. Prenatal stress modulates BAT differentiation and causes pro-inflammatory changes that is the foundation for metabolic disbalance in post-natal period. These findings advanced our understanding on brown fat functioning and provided insight to the role of BAT in metabolic regulation of physiological and pathological conditions.