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**ABSTRACTS**



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## 8.1.26 THE REACTION OF THYROID ON RADIATION INJURY AFFECTED BY MERCASOLIL

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The importance of oxygen in pathogenesis of radiation injury of tissues and cells of organisms is a well-known fact. The hormones of thyroid exercising influence on oxidation-restored processes may play an important role in mechanisms in developing radiation damage. The influence of antithyroid mercasolil preparation on thyroid under been learned. Vistar line white rats during different periods received mercasolil in doses causing hypothyroidism after which they were exposed to a single LD<sub>50</sub> dose of radiation. Characteristic changes of morphofunctional state of thyroid in all animals who received mercasolil were not always correlative with clinical and hematological data of radiation established. There are some definite variations in thyroid reaction in relation to mercasolil's dose. We confirmed increased thyroid radioresistance under the influence of mercasolil. Possible mechanisms of regulation are now under discussion.

## 8.2. Receptor mechanisms of hormonal-metabolic disorders

### 8.2.01 PROTECTIVE, ADAPTIVE AND PATHOLOGIC STRESS MECHANISMS IN RATS WITH EXPERIMENTAL PERITONITIS

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The aim of this research is studying protective, adaptive and pathologic endocrine mechanisms of stress and associated biochemical disturbances in the liver of rats under the conditions of experimental fecal peritonitis. The rats of Wistar line (weight 100-150g) were used in the research, which was conducted during the first twenty hours of the pathologic process. The levels of ACTH, corticosterone, beta-endorphin, TSH, thyroxine, triiodothyronine, insulin, glucagon, leucynkephalin immunoreactivity of blood were determined by means of radioimmunological test. In cytoplasm of liver cells the levels of corticosterone, tyrosineaminotransferase enzyme activity and levels of some metabolites were determined. The results showed that as experimental peritonitis stress progresses adaptive reactions of neuroendocrine, peptidergic and other systems of organism gradually develop into pathologic reactions. Associated biochemical reactions also become pathologic. Very high levels of hypercorticotestonemia, glucagonemia, decrease of leucynkephaline immunoreactivity and hypoinsulinemia were investigated. In cytoplasm of liver cells decrease of glucocorticoid receptors binding lowering of amino acid pull, glucose and increase of free fatty acid was noted. The beginning of stress reaction with the development of the acute inflammatory process in the abdominal cavity reflects the primary adaptive response of the organism without evident signs of disturbance in organs, but later the expressed hormone disturbance and disturbance of correlative interrelations and mechanism of self-regulation create metabolic basis for damage, in particular, in liver.

### 8.2.02 THE MECHANISM OF ACID-BASE BALANCE AND BLOOD GAS CONTENT REGULATION DISTURBANCES IN EXPERIMENTAL DIABETES

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Interrelations of heart function, coronary circulation, acid-base balance (ABB) alterations and blood gas contents were studied in alloxan-diabetic closed-chest dogs using catheterization and extracorporeal perfusion of coronary arteries, catheterization and continuous drainage of coronary sinus. Heart adrenergic reactivity in alloxan-diabetic animals was elevated. Blocking of beta-adrenergic receptors pO<sub>2</sub> caused more significant elevation of and blood oxygen saturation in coronary sinus and the more marked elevation of coronary arteriovenous differences of pO<sub>2</sub> and blood oxygen saturation as compared with healthy animals. These changes were induced by the elevation of sympathoadrenal system activity and hypercatechololemia which were due to insulin and catecholamines physiologic interaction disturbances. Enhanced heart adrenergic reaction in alloxan-diabetic animals maybe one of the reasons for catecholamine heart-damage action and the diabetic cardiomyopathy development. Blocking of m-cholinergic receptors in alloxan-diabetic animals removed the changes of ABB and gas contents in coronary sinus caused by insulin and adrenergic system interaction in adrenergic reactions and induced the less evident increase of pH, decrease of pO<sub>2</sub> blood oxygen saturation in coronary sinus blood and increased the coronary arteriovenous differences in the above mentioned indices as compared with the healthy animals. Therefore, changes of functional states of cholinergic and beta-adrenergic systems of blood circulation regulation are manifested in changes of ABB and arterial and venous blood gas contents.

### 8.2.03 DISTURBANCES IN GLUCOCORTICOID RECEPTION AND ITS CORRECTION

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The pathophysiology of many diseases is closely connected with the function of cytoplasmic glucocorticoid receptors (GCR). In human and animal organs and tissues we discovered Type II and III GCR. As a rule, tissues with a high level of Type II GCR (versus receptors) contain a low level of Type III GCR. Glucocorticoid sensitive tissues have a higher level of Type II GCR. Acute surgical diseases and experimental stress, accompanied by an increase of endogenous glucocorticoids, induce a rapid decrease of the level of Type II GCR and a slower decrease of the level of Type III GCR. Type II and III GCR in organs and tissues is restored in a quite rapid way, and this process correlates with the decrease of the increased level of glucocorticoids in blood. The decrease of the Type II GCR content is connected with the decrease of macromolecular biosynthesis in lymphoid tissue. On the contrary, in the liver macromolecular biosynthesis is increased. GCR employment as targets for medication of metabolism facilitated in determination of a number of perspective directions. The major interest is attracted by transformed steroid compounds, which do not have the glucocorticoid activity but compete with glucocorticoid for a bond in a GCR. Preparations capable of inhibiting Type II GCR (phenothiazine derivatives) seem significant. Finally, substances capable of increasing Type III (pyrasolone derivatives) content were found. In general, research findings of GCR give new possibilities in investigations of the glucocorticoid function mechanism regulation and its correction.

### 8.2.04 THE ROLE OF CENTRAL MECHANISMS IN THE REGULATION OF STEROID HORMONE PRODUCTION UNDER CONDITIONS OF STRESS IN PRIMATES

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