

## Comparative study of liver functional characteristics in combined pathologies by the method of electron paramagnetic resonance

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It's established that in combined pathologies the ways and mechanisms of liver tissue restoration is determined by pathology and degree of damage. Up to date, in biological and medical research in order to study the changes of functional activity of organs or tissue different methods are widely implemented. By this point of view electron paramagnetic resonance (EPR) is especially useful, it gives detailed information about functional changes of intact and pathologically modified tissues and organs.

**The aim of the work** was to determine functional characteristics of liver in combined pathologies by the EPR method.

**Materials and methods:** The investigations were carried out on 50 adult white rats (130-140 g). EPR signal changes from liver of intact and experimental animals was determined by the EPR method.

**Results and discussion:** in the cholestatic liver (the first four days) the nitrosyl complexes (HbNO) of mitochondrial heme-containing proteins were detected; free radicals EPR-signal intensity increased and its line widths reduced. This data indicate on the disorder of the hepatocytes mitochondrial electron transport chain on the NADH-ubiquinone-oxidoreductase segment. This is accompanied by development of hypoxia, decreasing of energogenesis (Mo<sup>5+</sup> EPR signal was increased), enhanced formation of reactive oxygen species and disruption of membrane structure (Mn<sup>2+</sup>-containing complexes was increased). In the hormone imbalance conditions (bilateral adrenalectomy) mitochondrial electron transport chain's free radical signal intensity was decreased which indicates impairment activity of the mitochondrial respiratory chain. After blocking the common bile duct in adrenalectomic rats, EPR- spectral changed in cholestatic liver are expressed more sharply. Results indicate that the degree of organ destruction in combined pathologies (bilateral adrenalectomy and cholestasis) is stronger.