FEATURES AND MECHANISMS OF ACUTE LUNG INJURY DEVELOPMENT ON THE BACKGROUND OF TYPE 2 DIABETES: THE ROLE OF HYPOXIA

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Features of comorbid course of lung inflammation and metabolic disorders and the role of hypoxia in these mechanisms need to be clarified. In rats with experimental insulin resistance and type 2 diabetes caused by high-fat diet and low dose streptozotocin administration, we induced acute lung injury by injecting bacterial lipopolysaccharide (LPS). It was shown that increasing severity of pneumonia and mortality was depended on the degree of tissue hypoxia caused by diabetes. We found the changes in the expression of PGC-1α, IGF-1, and SREBP-2 proteins, microRNA-1, -34a, and -320 in tissues under these conditions, which established their participation in both pathogenetic and protective mechanisms in lungs and myocardium. Furthermore, under the influence of moderate periodic hypoxia, we showed the link between the induction of hypoxia-dependent proteins and microRNA and the level of glycemia, and their possible participation in compensatory mechanisms. For the first time, the role of mitochondrial leptin receptors in changes in energy metabolism during LPS-induced lung inflammation and metabolic disorders was established. Thus, metabolic regulatory proteins, receptors and microRNAs may be links of close interaction of regulatory mechanisms that are responsible for the severity of the type 2 diabetes and lung inflammation in their comorbid development.