PARTICULARITY IN THE RESPIRATORY PATTERN AND ENERGY METABOLISM IN THE MODELING OF THE EXPERIMENTAL PARKINSONIAN SYNDROME


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In Wistar rats with rotenone-induced Parkinsonian syndrome (EPS), the features of the energy metabolism (aerobic link) and breathing regulation were examined. During the 2-week rotenone treatment, 16 animals ("resistive" animals, RA) were survived with signs of motor disorders (tremor, rigidity, bradykinesia and postural instability), 24 animals ("unresistive " animals, UA) died in a week. RA and UA were characterized by a phase changes in oxygen consumption (Vo$_2$). The first - hypometabolic - phase lasted up to 7 days in both groups. Then, in the RA group, there was a "switchover" (second phase), and the third - hypermetabolic - phase - began. The changes in the breathing were characterized by a stenoventilatory rebuilding in respiratory pattern, decreased minute ventilation (V$_E$) was accompanied by the drop of the respiratory volume (V$_T$) with a constant respiratory rate (f). In the 3rd day, with an increase in Vo$_2$, a reshaping of respiratory pattern was observed in isoventilatory mode, which was manifested in a significant augmentation in V$_T$ and a decrease in f, without changes in V$_E$. On 7th day, RA demonstrated an inverse isoventilatory breathing adjustment, which was characterized by a slightly decreased V$_E$ due to a decrement of V$_T$ with an increased f. In the following terms, V$_E$ and V$_T$ remained unchanged at the background of elevated f. Thus, the obtained data indicated that the development of EPS was accompanied by significant phase shifts in both metabolism and breathing regulation, which were similar to changes during hypoxic adaptation.