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Activity index of antioxidant system of processes as a diagnostic marker parenchymatous respiratory failure in newborns

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Background: The oxidative stress plays a very important role in the pathogenesis of respiratory insufficiency.

Objectives: To study the diagnostic and prognostic value in the assessment of pulmonary respiratory insufficiency in newborns.

Materials and Methods: The first group consisted of 34 newborns with severe respiratory insufficiency without radiological confirmation of parenchymal damage. The second group consisted of 50 newborns with severe form of hypoxemia, which was insufficiently controlled even with higher portion of oxygen concentration and there was an x-ray confirmation of pulmonary lung affection. Assessment of antioxidant protection was conducted by definition of superoxide dismutase (SOD) in pulmonary expirates. Pulmonary expirates were collected from the respiratory system circuit of the ventilator (while exhaling).

Results: The results of the research showed that the hyperactivity of antiradical protection in newborns from the second group was observed more in comparison with the newborns from the first group (11.38 ± 1.10 mg of protein of against 7.29 ± 0.77 mg of protein, $p < 0,01$). The results of receiver operating characteristic (ROC) analysis: an area under the ROC-curve is – 0.860 ± 0.0559, 95% of growing up, the confidential interval (CI) is – 0.735-0.941, $p < 0.0001$). According to the results of the research the division of respiratory insufficiency of the central and pulmonary genesis for index SOD in the concentration of the exhaled air is >9,321. This value has relatively high sensitivity and specificity, and predictive value of a positive result: the sensitivity of - 79.17 (95%: CI 57.8-92.9); specificity 92.59 (95% CI; predictive value of a positive result – 10.69 (95% CI); predictive value of a negative result – 0.23 (95% CI).

Conclusion: Thus, the study of quantitative characteristics of the state of the antioxidant system in the lung with the definition of SOD in respiratory insufficiency will provide a more complete description of the diagnostic syndrome and the study of dynamic changes.