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THE FUNCTIONAL STATUS OF THE PROOXIDANT AND ANTIOXIDANT SYSTEMS IN THE LIVER IN THE DYNAMICS OF FORMATION OF EXPERIMENTAL PNEUMONIA

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Abstract

Pneumonia occupies a large share in the structure of the respiratory disease. Today in practice physician often found both hypo- and overdiagnosis pneumonia. Over the past thirty years, mortality from pneumonia increased from 1 to 9% and most often occurs in people older than 55 years of age. The study was conducted on 40 guinea pigs (male) weighing 180-220 g. The experimental model of pneumonia by intranasal infection reproduced animals culture *Staphylococcus Aureus* method. The results of the studies found that on 1st day staphylococcus infection animal control and MDA content not experienced significant changes to intact animals. Experimental pneumonia accompanied by noticeable imbalance between prooxidant and antioxidant systems towards growth inhibition of oxidative and antioxidant systems.

Keywords: experimental pneumonia, liver, lipid peroxidation, antioxidant system.

INTRODUCTION

Pneumonia occupies a large share in the structure of the respiratory disease. Zahoryuvannya in the twenty-first century is an important medical and social problem because it leads to significant economic losses, causing periods of disability. Today in practice physician often found both hypo- and overdiagnosis pneumonia. As you know, late and wrong diagnosis and improper treatment lead to severe complications. Over the past thirty years, mortality from pneumonia increased from 1 to 9% and most often occurs in people older than 55 years of age [3,4].

Etiological factors of the disease today is already known, but is not fully elucidated the mechanism of pneumonia [4] studied the issue is not related to oxidative (diene kon`yuhaty, malonic dialdehyde) and antioxidant (superoxide dismutase, catalase) of the liver in different periods of pneumonia.

It is known that lipid peroxidation (LPO) normally carried out continuously in all tissues and cells of living organisms and is supported by special regulatory systems at a low basal level. They are involved in physiological metabolic processes and regulatory functions of cells. The well-known destructive effects on cell membranes of primary and secondary products of lipid peroxidation [6]. Protection from damaging effects provide antioxidant enzymes superoxide dismutase (SOD), catalase (CT).

The purpose of our research - find out functional features PROOXIDATIVE and antioxidant systems in liver formation dynamics in experimental pneumonia (EP).

MATERIALS AND METHODS

The study was conducted on 40 guinea pigs (male) weighing 180-220 g, which were divided into 5 groups: the first group - control (intact) animals (8); the second group - the animals with EP (8) on the 1st day of EP; third group - the animals with EP (8) on the 3rd day; fourth group - the animals with EP (8) on the 6th day EP; fifth group - the animals with EP (8) on the 10th day of VC.

The experimental model of pneumonia by intranasal infection reproduced animals culture *Staphylococcus Aureus* method V.N.Shlyapnykova, T.L.Solodova, S.A.Stepanova (1988) [5].

Then intact animals were decapitated under ether anesthesia and guinea pigs on the 1st, 3rd, 6th and 10th day of EP.

The content of diene kon`yuhativ (DC) were determined according V.H.Havrylova, V.I.Myshkorudnoyi [1], malondialdehyde (MDA) - method E.N.Korobeynikova [2], superoxide dismutase (SOD) - for by R.Fried [7], catalase (CT) - for R.Holmes [8].

Processing of digital data produced by the method of variation statistics using Student's t test.

RESULTS AND DISCUSSION

When there is a change of experimental studies of antioxidant activity and lipid peroxidation in the dynamics of experimental pneumonia.

Determination of diene kon`yuhativ and malondialdehyde used to assess the intensity of POL.Diyenovi kon`yuhaty are primary products of free radical oxidation. Among the indicators of lipid peroxidation is one of the most important malonic dialdehyde, which is the end product of lipid peroxidation and its share is 40% of all products of lipid.

The results of the studies found that on 1st day staphylococcus infection animal control and MDA content not experienced significant changes to intact animals

Later on the 3rd day of experimental pneumonia content DK- an increase 65,2% (P <0,05) and MDA at 38.8% (P <0,05) compared with controls, indicating that activation of peroxidation in guinea pigs .

Stored accumulation of lipid peroxidation products on the 6th day - a gradual increase in control at 69,5% (P <0,05) and MDA by 50% (P <0,05) in accordance with the values of intact animals, indicating the continuation stimulation PROOXIDANT system in the latest period (10th day) EP, these figures reached the highest change: DC increased by 82.6% (P <0,05), and MDA by 58% (P <0,05) compared with the control group. (Figure 1).

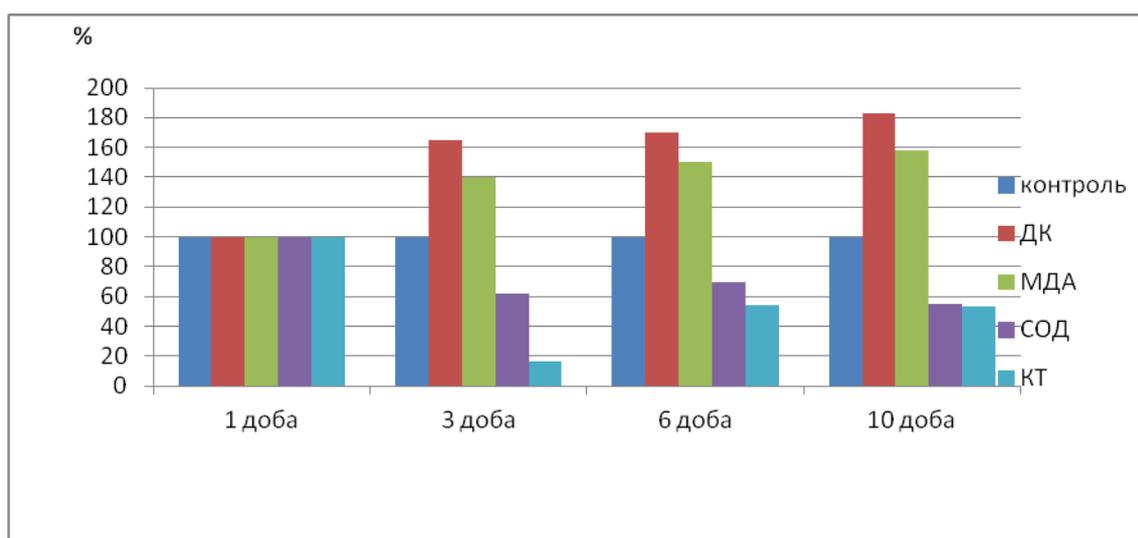


Fig. 1 The content of lipid peroxidation products in the liver and AOC in the dynamics of VC (% of control).

Thus, the increase in DC and MDA in experimental pneumonia in guinea pigs indicates a gradual excessive formation of lipid peroxidation products, based on length of inflammation in the lungs. However, early in the formation of VC (1st day) found that the activity of SOD and CT zmin.Tsi not experienced significant indicators were level control.

The activity of superoxide dismutase (SOD) on the 3rd day of EP suppressed to 38,0% (P <0,05) and catalase to 84,0% (P <0,05). Later on the 6th day of EP observed depletion of antioxidant protection - reducing ODS to 27,0% (P <0,05), catalase - by 46,0% (P <0,05) compared to the first group of animals indicating depression AOC (Figure 1).

Late period that included the 10th day of the experiment was characterized by extreme changes in antioxidant defense system, including SOD activity is suppressed to 45,0% (P <0,05) and catalase to 47,0% (P <0,05) compared to the first group of animals, indicating a decrease of antiradical defense against a background of strengthening the LPO.

CONCLUSION

Thus, experimental pneumonia accompanied by noticeable imbalance between prooxidant and antioxidant systems towards growth inhibition of oxidative and antioxidant systems. According to the results, there is a significant activation of antioxidant mechanisms of the third day, especially with the gradual depletion of the sixth and tenth days of experimental models of disease processes and increased lipid peroxidation and indicates the formation oxidativ stress in experimental pneumonia.

REFERENCES

1. Havrylov V.B. Spectrophotometric determination of lipidhydroperoxides in plasma. M.Y. Myshkorudnaia. Laboratory diagnosis of coronary heart disease. , 1989. – C.170 – 171.
2. Korobeinykova Ə.N. Modification of the definition of lipidperoxid at ionproducts in the reaction with thiobarbituric acid. 1989. - №7. – C.8 – 10.
3. Reheda M.S Pneumonia / M.S. Reheda, 3rdreprint // - Lviv, spol, 2005. C-138.
4. Reheda M.S. In flammatory disease of the lungsand bronchi. - 2008. – C 206.
5. V.N. Shliapnykov, T.L. Solodova, S.A. Stepanov The experimental model of acute pneumonia, caused byopportunistic bacteria -patogennymi and their associations. - 1988. – 30.
6. Valko M. Metals, Toxicity and Oxidativ Stress / M.Valko, H.Morris. M.T. Cronin//Curt. Med. Chem. – 2005/ Vol. 12,№ 10. – P. 1161 – 1208.
7. Fried R. Enzymatik and non-enzymatic assay of superoxide ifilii/ R.Fried//Biochemie. – 1975. – Vol.57,№5. – P. 657 – 660.

8. Holmes R. epigenetic interconversions of the multiple forms of mouse liver catalase
/ R.Holms,C.Masters//FEBS Lett. – 1970. Vol. 11,№1. – P. 45 – 48.