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THE LEVEL OF ENDOGENIC INTOXICATION IN THE DYNAMICS OF DEVELOPMENT OF EXPERIMENTAL CONTACT DERMATITIS AND EXPERIMENTAL PNEUMONIA AND THEIR CORRECTION BY THIOTRIAZOLINE

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Abstract

The aim of our work was to find out the peculiarities of changes of endogenous intoxication indices in guinea pig blood during the formation of combined pathology - experimental contact dermatitis and experimental pneumonia and correction of their disorders with thiotriazoline.

The paper found a gradual increase in the molecules of medium mass and erythrocyte index of intoxication in guinea pig serum with experimental contact dermatitis and experimental pneumonia with the highest degree of expression on the 18th day of the experiment, and this may be may indicate the development of endogenous intoxication of the animal body.

At the same time, the use of the drug thiotriazoline caused the decrease of the studied indicators, which gives grounds to state its positive effect on certain markers of endogenous intoxication and the feasibility of further research.

Key words: contact dermatitis; pneumonia; endogenous intoxication; thiotriazoline.

РІВЕНЬ ЕНДОГЕННОЇ ІНТОКСИКАЦІЇ В ДИНАМІЦІ РОЗВИТКУ ЕКСПЕРИМЕНТАЛЬНОГО КОНТАКТНОГО ДЕРМАТИТУ ТА ЕКСПЕРИМЕНТАЛЬНОЇ ПНЕВМОНІЇ ТА ЇХ КОРЕКЦІЯ ТІОТРИАЗОЛІНОМ

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Метою нашої роботи було з’ясувати особливості змін показників ендогенної інтоксикації у крові морських свинок при формуванні об’єднаної патології – експериментального контактного дерматиту та експериментальної пневмонії та корекція їх порушень тіотриазоліном.

Дослідження показників молекул середньої маси і еритроцитарного індексу інтоксикації у різні періоди розвитку експериментального контактного дерматиту та експериментальної пневмонії показало поступове їх зростання у сироватці крові морських свинок з найбільшим ступенем вираженості на 18-у добу експерименту, а це ймовірно може свідчити про розвиток ендогенної інтоксикації організму тварин.

Водночас застосування препарату тіотриазоліну зумовлювало зниження досліджуваних показників, що дає підстави констатувати про його позитивну дію на окремі маркери ендогенної інтоксикації і доцільність проведення подальших досліджень.

Ключові слова: контактний дерматит; пневмонія; ендогенна інтоксикація; тіотриазолін.

УРОВЕНЬ ЭНДОГЕННОЙ ИНТОКСИКАЦИИ В ДИНАМИКЕ РАЗВИТИЯ ЭКСПЕРИМЕНТАЛЬНОГО КОНТАКТНОГО ДЕРМАТИТА И ЭКСПЕРИМЕНТАЛЬНОЙ ПНЕВМОНИИ И ИХ КОРРЕКЦИЯ ТИОТРИАЗОЛИНОМ

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Целью нашей работы было выяснить особенности изменений показателей эндогенной интоксикации в крови морских свинок при формировании объединенной патологии - экспериментального контактного дерматита и экспериментальной пневмонии и коррекция их нарушений

Исследование показателей молекул средней массы и эритроцитарного индекса интоксикации в разные периоды развития экспериментального контактного дерматита и экспериментальной пневмонии показало постепенный их рост в сыворотке крови морских свинок с наибольшей степенью выраженности на 18-е сутки эксперимента, а это вероятно может свидетельствовать о развитии эндогенной интоксикации организма животных.

В то же время применения препарата тиотриазолина приводило к снижению исследуемых показателей, что дает основания констатировать его положительное воздействие на отдельные маркеры эндогенной интоксикации и целесообразность проведения дальнейших исследований.

Ключевые слова: контактный дерматит; пневмония; эндогенная интоксикация; тиотриазолин.

Introduction. Pneumonia and contact dermatitis are some of the most common human diseases that occurred in the 21st century, which remain important medical and social problems. Among respiratory diseases, pneumonia remains one of the most essential problems of practical pediatrics [7]. However, the true prevalence of this disease is unknown, which is related to the hyperdiagnosis of pneumonia at the hospital and hypodiagnosis at the outpatient stages of treatment [7]. The rate of hospitalizations for this disease increases more than 10 times with age. The mortality rate for pneumonia among patients over 60 years of age is 10 times higher than in other age groups and reaches 10-15% for pneumococcal

pneumonia. Older people are more likely to experience severe pneumonia, so they have a higher need for hospitalization. The relevance of the problem of contact dermatitis for health and society is determined by their prevalence, complexity of diagnosis and treatment, impact on quality of life, as well as social consequences [6].

Endogenous intoxication (EI) is considered as one of the most important criteria that determines the severity of patients. EI is a nonspecific syndrome characteristic of many diseases, accompanied by the increase and accumulation of toxic metabolites [2]. It is this that causes the destruction of plasma and cytoplasmic membranes, leads to the development of toxemia - the release of blood from the local cell of toxins that cause the generalization of the pathological process. Suitable for the correction of the studied changes in the use of the drug thiotriazoline, which exhibits detoxication, antioxidant, membrane stabilizing, immuno-correcting properties, improves reparative processes, will optimize the results of treatment, namely to reduce the level of endogenous intoxication.

Therefore, the aim of our work was to investigate the peculiarities of changes in endogenous intoxication rates: medium mass molecules (MMM) and erythrocyte intoxication index (EII) in the blood of guinea pigs in the formation of combined pathology - experimental contact dermatitis (ECD) and experimental pneumonia (EP) and to correct them by thiotriazolin.

Materials and methods. Researches were conducted on guinea pigs, divided into six groups: I - control, II – 4^{th} day of expirement, III – 8^{th} day of contact dermatitis development and experimental pneumonia, IV – 10^{th} day and V - 18^{th} day of model processes and VI group - guinea pigs with ECD and EP after treatment with thiotriazoline during 10 days (from 8^{th} to the 18^{th} days of the experiment). For the purpose of detailed analysis and interpretation of EI indicators in different days of the experiment, two periods of development of ECD and EP were distinguished: early and late. The chosen days of ECD and EP were due to the classical stages of the inflammatory process. Early period included groups of animals on the 4^{th} and 8^{th} days of experiment. The late one – guinea pigs on the 10^{th} and 18^{th} days of ECD and EP.

Experimental contact dermatitis was simulated by method of VA Volkovoj (2010). EP was called by the method of VN Shlyapnikov, TL Solodov (1998). Thiotriazoline was administered intramuscularly at a dose of 100 mg per 1 kg of weight daily from the 8^{th} to the 18^{th} days of the experiment. The study material was collected under ether anesthesia. In all groups of guinea pigs there were determined the MMM concentration in blood in the wave of 254 nm and 280 nm by IA Volchehorskiy, DA Dyatlova, EI Lvovska and others methods [4]

and EII by DK Shmojlova methods [5]. Numerical results were adapted with static method using Student's criteria.

Results of the study and their discussion. Among the indicators of endogenous intoxication, a fairly accurate criterion for the presence and expression in the body is the concentration of MMM in the blood of patients. This indicator is used as a marker of intoxication of different genesis to determine the severity of the pathological process [2]. The results of our studies show that the content of MCM_{254} and MCM_{280} in the blood of animals begins to increase from the 4th day of the experiment, namely in the second and third groups of animals in this experiment, their level increases in the blood by 27.3% and 42.1% respectively ($p \leq 0.05$) MMM_{254} and 18.9% and 31.3% ($p \leq 0.05$) MMM_{280} compared to intact guinea pigs. A similar direction of change is observed as the pathological process develops. Thus, in the late period of development of the experimental model, the level of MMM_{254} and MMM_{280} further increases respectively by 49.3% and 55.5% ($p \leq 0.05$) on the 10 th day and by 99.7% and 102.3% ($p \leq 0.05$) on the 18 th day of ECD and EP when compared with control values.

One of the important markers of endogenous intoxication is the erythrocyte intoxication index. The results of the studies showed a similar nature and direction. Thus, in this experiment, there was a gradual and rather intensive increase of the studied index by 49.6%, 72.3%, 83.8% and 90.1% ($p \leq 0.05$), respectively, on the 4 th, 8 th, 10 th and 18 th days of this combined model compared to the first group of animals. Dynamics of endogenous intoxication increasing in the blood of guinea pigs in ECD and EP are presented in Table 1.

Table 1 - The MMM and EII levels in the blood of guinea pigs with experimental contact dermatitis and experimental pneumonia (M ± m, n=51)

Research form	Term of disease (days)	Animal number	**MMM_{254},** conditional units	**MCM_{280},** conditional units	**EII,%**
Intact animal. Control		15	0,391±0,01	0,380±0,01	30,4±1,7
Guinea pigs in ECD and EP	4	9	0,498±0,01	0,452±0,01	49,5±1,9
	8	9	0,556±0,01	0,499±0,01	52,4±2,1
	10	9	0,584±0,01	0,591±0,02	55,9±2,2
	18	9	0,781±0,03	0,769±0,03	57,8±2,3

The data show that the highest level of endogenous intoxication in the blood was in the fifth group of guinea pigs with ECD and EP (at 18th day), which indicates a direct dependence of the time of antigenic influence on their severity.

The use of thiotriazoline for 10 days (from 8th to 18th day) caused to the decrease of the MMM_{254} concentration to 22.9% ($p_1 \leq 0.05$), MMM_{280} to 24.4% ($p_1 \leq 0.05$) and EII - 29.4% ($p_1 \leq 0.05$) in serum compared with the guinea pig group, which was not administered this drug, indicating its corrective effect.

Conclusions. Thus, the study of indicators MMM_{254}, MMM_{280} and EII in different periods of development of ECD and EP showed a gradual increase in serum of guinea pigs with the highest degree of expression on the 18 th day of the experiment, and this may indicate the development of endogenous intoxication of the animal. At the same time, the use of the drug thiotriazoline caused their decrease, which gives grounds to state its positive effect on certain markers of endogenous intoxication and the feasibility of further research.

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