



The influence of physical loading to erythroform indicators in rabbit puppies suffered hypoxia

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Abstract

In our research we investigated the influence of physical loading to erythroform change in the periferic blood of 30 days rabbit puppies suffered hypoxia in the prefetus period of prenatal development. In normal and prefetus period of prenatal development, in the blood of 30 days rabbit puppies borned by mothers suffered hypoxia rising appeared in some erythroform indicators, in others, reducing appeared after the influence of physical loading. (table 1, figure 1,2) So, the cause of noticable changes in erythroform indicators of rabbit puppies suffered hypoxia after physical loads influence is appearing of disorder in neuro-endocrine regulation of the blood in the result of hypoxia.

Keywords: hypoxia, physical loading, prenatal, postnatal, prefetus period, erythroform

1. Introduction

In periferic blood, the influence of physical loading to blood indicators of animal and human organism remains one of less studied problems of the scientific works. According to the scientific works, prenatal and postnatal hypoxia creates homostatic in brain and pathological changes in homostaz, in defense-adaptation reactions and in neuro-humoral regulation mechanizms and becomes a danger for body growth and development. (Aliyev *et al.*, 2009, Hutter *et al.*, 2010, Gussani *et al.*, 2007) ^[1, 4, 7] That is why, the investigation of long-term hypoxia influence to the human and animal organism (rabbit, japanese qual, white rats, cavy) remains one of the most important problems of physiology and medicine in our day.

In different age periods, in human and animal organism reducing the amount of oxygen causes physiological characteristics changes and growth of membrane, cytoplasmic and genetic aparat of the cell. (Chen *et al.*, 2007, Beshlawy *et al.*, 2004) ^[3, 5].

Studying of pathological changes observed in physical work, hypoxia and in sugar cargo condition in the normal course of physiology and in biochemical processes attract the attention of scientific workers. (Aliyeva *et al.*, 2013, Magyar *et al.*, 2001, Ogoh *et al.*, 2005) ^[2, 8, 9] During carrying out physical work, there is change of metabolism direction in the base of observed changes. In the organism highing the speed of katobolic processes observed with ATP synthesis and energy allocation, at the same time the speed of anobolic processes reduces. Such kinds of changes creates condition to adopt working muscle with energy and increases strength and duration of performed work. During physical work speeding up oxydation process causes to be expelled the thermal energy. Strong sweat excreting, speeding up heart and breath activity is compensated with the evaporation of the water in

exhaling air. (Gonzales-Alonso *et al.*, 2004, Paniccia *et al.*, 1993) ^[6, 10].

Considering experimental works urgency connected with the short and long- term physical load influence, our main purpose carrying out this experimental work is to investigate the physical load influence to erythroformul indicators of 30 days rabbit puppies suffered hypoxia in prenatal ontogenesis. In the experimental work, spended the development in normal condition, erythroform indicators dynamics was investigated in the blood of 30 days rabbit puppies suffered hypoxia in the prefetus period of prenatal development.

2. Materials and methods.

Researches were carried out on the rabbit pups of the "Shinshila" species. (Oroktoloques Suniculus) Animals are divided into two groups: Control and experimental. Control group animals were kept in ordinary vivarium condition. But experimental group animals suffered hypoxia by Khatova method in prefetus period of pregnancy 20 minutes a day in pressure chamber. But they were kept in normal vivarium condition in the next stages. For applying the physical burden animal has been placed in a hollow drum type mechanical device and then the drum circumference is moving 40-45 circles during a minute, in some experiments 5 minutes (short-term physical load) in other experiments 20 minutes (long-term physical load) it has been moved. For analyses blood is taken from the edge vein of ear. General blood tests were carried out in apparat with 21 parameters MYTIC18. The gained results are summerized in the following table 1 and figure 1,2.

3. Results and Discussion

From the table and figure it seems that, until hypoxia and

physical load in control group erythroform indicators of blood are as follows. Erythrocytes 4.29 thousand±0.13, erythrocyte sedimentation rate (ESR) 2.69±2.02, hemoglobin 8.36±0.31, platelets 56.19±1.84. In this group indicators became as follows after short-term physical load erythrocytes 4.30 thousand ±0.38, ESR 1.33±0.43, hemoglobin 8.66±0.19, platelets 19.21±8.55. After long-term physical load indicators became: erythrocytes 4.29thousand±0.12, ESR 1.47±0.32, hemoglobin 8.66±0.33, platelets 28.57±3.33.

Comparing the results after a short and long-term physical load with control group different changes are observed in

some erythroform indicators of blood.

The 30-day baby rabbits borned of mothers suffered hypoxia in the prefetus period, the change of erythroform indicators were as: erythrocytes 3.92 thousand±0.70, erythrocyte sedimentation rate (ESR) 1.73±1.0, hemoglobin 8.55±0.34, platelets 86.00±7.21. After short-term physical load erythrocytes 4.79 thousand ±0.74, ESR 1.15±0.06, hemoglobin 9.68±0.40, platelets 254.50±10.48. After long-term physical load indicators became: erythrocytes 4.29thousand±0.12, ESR 1.45±0.33, hemoglobin 10.20±0.04, platelets 55.50±6.71.

4. Tables and Figures

Table 1: The influence of physical loading to erythroform indicators

Defined indicators	Experimental situation					
	Norma control	Physical load		Prefetus period		
		5 min.	20 min.	Hypoxia control	5 min.	20 min.
Erythrocytes	4.29±0.13	4.30±0.38	4.29±0.12	3.92±0.70	4.84±0.31	4.79±0.74
P	<0.001	<0.001	<0.001	<0.001	>0.2	>0.2
ESR	2.69±2.02	1.33±0.43	1.47±0.32	1.73±1.0	1.15±0.06	1.45±0.33
P	>0.5	>0.5	<0.001	<0.001	<0.01	<0.001
Hemoglobin	8.36±0.31	8.66±0.19	8.66±0.33	8.55±0.34	9.68±0.40	10.20±0.04
P	<0.001	<0.001	<0.001	>0.2	<0.02	<0.001
Platelets	56.19±1.84	19.21±8.55	28.57±3.33	86.00±7.21	254.50±10.48	55.50±6.71
P	<0.001	<0.001	<0.001	<0.001	<0.001	>0.2

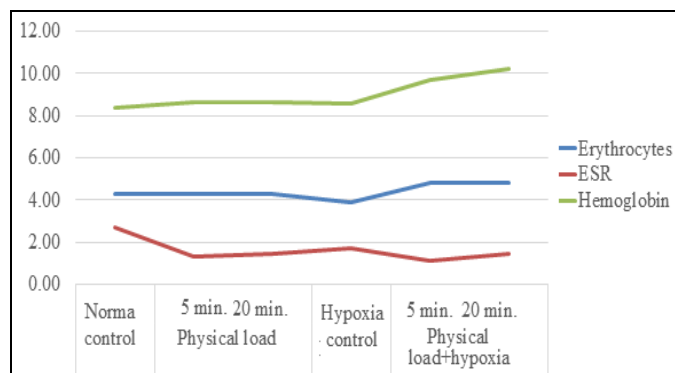


Fig 1: The influence of physical loading to erythroform indicators

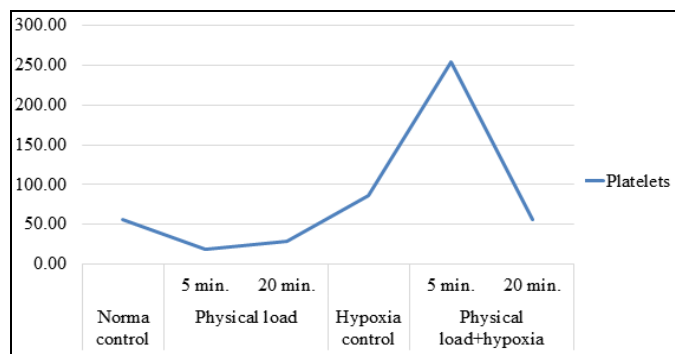


Fig 2: The influence of physical loading to platelets

5. Conclusions

It was determined that the cause of reducing and rising in blood indicators (erythrocytes, erythrocyte sedimentation rate, plates) of 30 days rabbit puppies, borned by mothers suffered prenatal hypoxia, is the disorder of metabolism between

tissues and cells and in neuro-endocrine regulation of defense system of organism after short and long physical load influence. Based on the foregoing, almost, as a stressor factor hypoxia and physical load cause disorder in blood system. So hypoxia causes to disorders in the body's antioxidant defense system. In the result in our experiments, after short and long term physical load it causes changes in some blood morphological indicators of 30 days rabbit pups borned by mothers suffered hypoxia in prefetus period. And it influences negative to neuro-endocrine regulation of blood changes. According to a comparative analysis, it can be noted that as a strong stressor factor hypoxia causes to adrenal disorder during short-term physical load, but long-term physical load causes disorder of glikokortikoid to the blood. It causes metabolic disorders of the epitalamo-hypothalamus hypophizar-adrenal gland in blood system. In the result hypoxia causes disorders of blood morphological indicators in neuro-endocrine regulation in the periferic blood.

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