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ВЛИЯНИЕ ФИЗИЧЕСКИХ НАГРУЗОК В ЭМБРИОНАЛЬНЫЙ ПЕРИОД ПРЕНАТАЛЬНОГО РАЗВИТИЯ НА ИЗМЕНЕНИЯ В КОМПОНЕНТАХ КРОВИ У ГИПОКСИНАЛЬНЫХ ДЕТЕНЫШЕЙ КРОЛИКОВ

Аннотация: *было исследовано влияние физической нагрузки в течение пренатального периода на динамику некоторых компонентов крови у 30-дневных кроликов. С этой целью изучены у нормальных и подопытных детенышей кроликов изменения после кратко- и долгосрочных физических нагрузок по некоторым морфологическим показателям крови 30-дневных детенышей кроликов, рожденных матерями, страдавшими от гипоксии в течение эмбрионального периода пренатального развития. Значительные изменения отмечаются при сравнении данных, полученных от контрольных животных, с данными, полученными от подопытных. Снижение или рост отмечался в некоторых элементах крови после физических нагрузок в течение 10 дней по 20 минут каждый день эмбрионального периода пренатального развития у 30-дневных нормальных детенышей кроликов и 30-дневных детенышей рожденных матерями, страдавшими гипоксией. Таким образом, уровень индикаторов крови в нормальном состоянии и состоянии гипоксии зависит от состояния центральной нервной системы.*

Ключевые слова: *гипоксия, кратко- и долговременная физическая нагрузка, пренатальный, постнатальный, эмбриональный периоды, кровь.*

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IN THE FETAL PERIOD OF PRENATAL ONTOGENESIS THE PHYSICAL LOADING EFFECT OF BLOOD COMPONENTS DYNAMIC CHANGES IN HYPOXIANAL BABY RABBITS

Abstract: *the influence of physical load to some blood components dynamics in 30-days baby rabbit's blood during prenatal period was investigated by us. That's why*

changes of normal and experimental rabbit puppies after short and long term physical load in some morphological indicators were explored through blood of 30-days rabbit puppies born by mothers suffered from hypoxia during fetal period of prenatal development. Significant changes occurred by comparison results from experiments on control animals with the results from experiment on experimental animal. Reduction and rising appeared in some indicators of blood elements after physical load in 30-days normal rabbit puppies blood and in 30-days rabbit puppies born by mothers suffered hypoxia during 10 days 20 minutes every day in fetal period of prenatal development. Therefore the level of blood indicators in normal and hypoxia condition depends on the condition of central nervous system.

***Keywords**: Hypoxia, short-term physical load, long-term physical load, prenatal, postnatal, fetal period, blood.*

Introduction

For the scientific informations given in the literatures, prenatal and postnatal hypoxia creates pathological changes in brain, defense adaptation reactions, neuro-humoral regulation mechanism and becomes danger for body flourishing and developing of organism. So, hypoxia in prenatal development, in all animals may influence to the physiological systems in postnatal period that's why, the investigation of long-term hypoxia influence to the human and animal organism remains the most important problems of physiology and medical [3; 4; 9].

In different age period either in human or animal organizm oxygen reducing causes changing and flourish of physiological features of membrian and cytoplasm and genetic aparat of cells [1; 2; 6; 8]. Hypoxia appears in blood lost, miacard infarct, CO poisoning, hard and light physical load. From experimental works, it becomes clear that postnatal effects of prenatal hypoxia may appear from nervous cell till fluid texture in protein and ferment synthesis in energetic substrats use and these shortage can cause pathalogical changes in growithing children and older's organizm. Even it can be danger for the babys' lifes. Scientific workers is interested in learning pathalogical

changes observed during physical work, hypoxia and sugar load condition in normal physiological and biochemical processes [10; 11; 14].

As we know, in short-term intensive load condition in result of a few oxygen receiving of workers anaerobic load milk acid being anaerobic glucoza product is assembled in blood which causes acidosis in blood. Acidosis is strog stimulator for breathing and breathing intensive highing supplies fluid texture with oxygen and it causes to appear CO_2 and H_2O which is the product of repeated aerobic breaking up of milk acid. In this process main regulative factor causes to the excrete of adrenalin to blood and to be mobilized glucose in liver and strength glycogenolysis (turning glycogen to the glycosa) in the active muscle.

During medium and log-term load condition in energy supplying either aerob fragmentation of glucose and lipid oxidation (oil acid and ketone objects) takes part. If physical load is intensive aerob fragmentation of glucose becomes intensive too or vice versa. These loads cause (medium, long term) to the excrete of adrenaline to blood, mobilized glucose from liver (glycogenolize) and mobilizing oil acid from oil fluid texture. If load would be long-term and intensive sufficiently (for example marathon) then glycocord-useful for aerob breaking up of glucose exrete to the blood [5; 7; 12; 13].

Our main purpose to investigate this work is to learn the influence of physical load to some morphological indicators changes of the blood of the 30-days rabbit puppies suffered hypoxic-hypoxia in fetal period of prenatal development.

The research material and methods

Experiments were carried out on the rabbits belonging to the «Shinshila» genus animals were divided 2 groups: For experiment and control.

Animal belonging to the experimental group received hypoxia in prenatal development period as an experimental animals, control group animals kept in ordinary vivarium condition, they were kept in cells ventillated by normal pressure and air condition and was adapted to this kind of condition. In experiment group in fetal period of prenatal development pregnant rabbits suffer 20 minutes in a day during 10 days in pressure chamber with ventilation.

Hypoxia was carried out in pressure chambers with square 0.12 m² by Xvatova method. For that, pregnant rabbits suffered hypoxia in fetal periods with same time condition, during 20 minutes, in pressure chamber. So, pregnant rabbits were breathed by mixture gazes with 93% N, 7%. O_2 in their composition in the pressure chamber.

The influence of hypoxia to the rabbits behavior was observed in the investigation process. The rabbits suffered hypoxia were kept in normal vivari conditions.

In next period of research, with special methods, in the blood example of control group and in rabbits puppies suffered hypoxia in prenatal development period the level and amount of some blood indicators was determined.

For applying the physical burden animal is placed in a hollow drum type mechanical device, and then the drum circumference is moving of 40–45, with the experiments 5 minutes (short-term physical load) in other experiments, 20 minutes (long-term physical load). Blood is taken from the air vein for analyses. General blood tests were carried out on in apparatus with 21 parameters Mytic 18. The gained results are summarized in the following table.

Table 1

In the fetal perıod of prenatal ontogenesıs the physıcal loadıng effect of blood components dynamıc changes in hypoxıanal rabbıt puppıes ($M \pm m$); *n=18*

The specified indicators	*Conditions of experience*					
	Control	Control		Fetal period		
		The physical load		Hypoxia	The physical load + hypoxia	
		5 minutes	20 minutes		5 minutes	20 minutes
Erythrocytes	4.29 ± 0.13	4.30 ± 0.04	4.29 ± .0.12	3.65 ± 0.17	4.69 ± 0.36	4.49 ± 0.29
P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.02
ESR	2.69 ± 2.02	1.33 ± 0.43	1.47 ± 0.32	2.43 ± 0.28	1.47 ± 0.21	1.35 ± 0.20
P	< 0.5	< 0.5	< 0.001	> 0.2	< 0.001 > 0.5	< 0.001
Hemoglobin	8.36 ± 0.31	8.66 ± 0.19	8.60 ± 0.33	8.1 ± 0.76	9.80 ± 0.29	10.35 ± 0.46
P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Platelets	56.19 ± 1.84	19.21 ± 8.55	28.57 ± 3.33	43.3 ± 1.17	148.60 ± 3.15	168.51 ± 3.35
P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

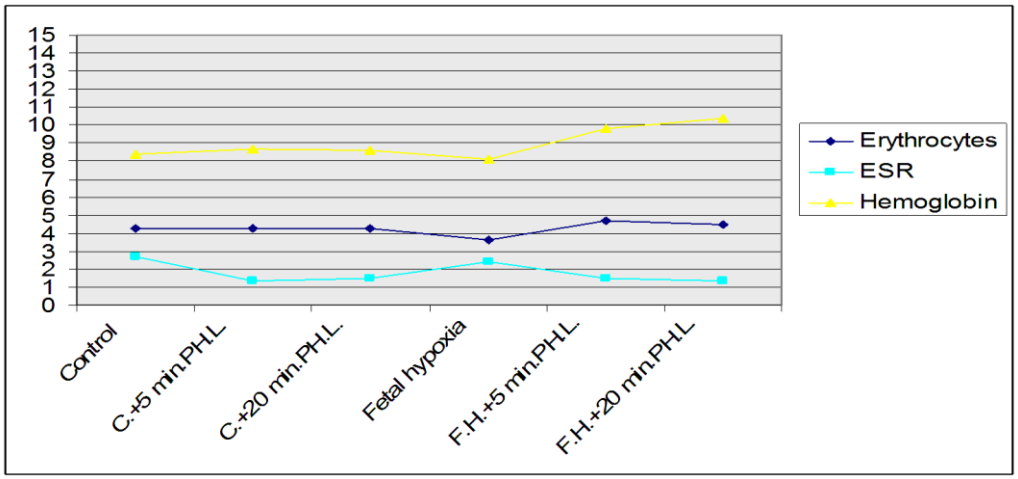

Chart 1. In the fetal perıod of prenatal ontogenesıs the physıcal loadıng effect of blood components dynamıc changes ın hypoxıanal rabbıt puppıes (M ± m); n=18

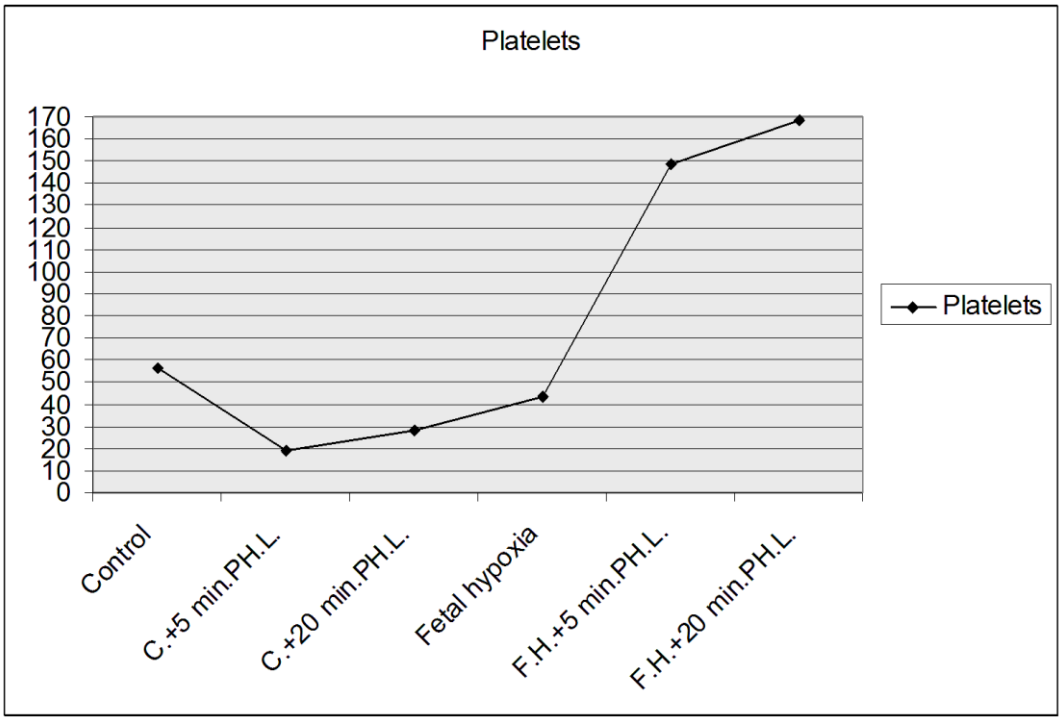

Chart 2. In the fetal perıod of prenatal ontogenesıs the physıcal loadıng effect of platelets dynamıc changes ın hypoxıanal rabbıt puppıes (M ± m); n=18

– *C – Control*

– *PH.L. – Physical load*

– *F.H. – Fetal hypoxia*

Inverstigation result and their discussion

From the information given in table and charte it seems that, until hypoxia and physical load in control group morphological 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 (p = 0.5 – 0.001) and differ each other in the control. In the control rabbits indicators became as follows after short-term physical load erythrocytes 4.30 thousand ± 0.04, ESR 1.33 ± 0.43, hemoglobin 8.66 ± 0.19, platelets 19.21 ± 8.55. After long-term physical load indicators became: erythrocytes 4.29 thousand ± 0.12, ESR 1.47 ± 0.32, hemoglobin 8.60 ± 0.33, platelets 28.57 ± 3.33. Statistical exponent after short and long term physical load has changed between p = 0.001–0.5.

Comparing the results after a short and long-term physical load with intact animals-control group different changes are observed in some morphological indicators of the blood.

Amount of erythrocytes is 3.65 thousand ± 0.17, ESR 2.43 ± 0.28, hemoglobin 8.1 ± 0.76, platelets 43.3 ± 1.17 in 30-day baby rabbits which borned of mothers suffered hypoxia in the prefetus period. These changes are as follows after short-term physical burden. Quantity of erythrocytes is 4.69 thousand ± 0.36, ESR 1.47 ± 0.21, hemoglobin 9.80 ± 0.29, platelets 148.60 ± 3.15. After long-term physical load erythrocytes were 4.49 thousand ± 0.29, ESR 1.35 ± 0.20, hemoglobin 10.35 ± 0.46, platelets 168.5 ± 3.35.

Result

Comparing the results gained after short and long terms physical load with normal group various changes may be observed in some morphological indicators of blood. Different results are gained after short and long terms physical load in morphological indicator of blood in 30-day rabbits puppies blood born by mothers suffered hypoxia in fetal period of prenatal development. These changes had also differed each other compared with control and fetal period.

The rising and reducing cause in blood indicators of 30-day rabbit puppies suffered prenatal hypoxia is regulation of metabolism of between tissues and cells and

disorders in neuro-endocrine regulation of body's defense system. So hypoxia is caused to disorders in the body's antioxidant defense system. In the result, in our experiments after short and long-term physical load it causes to changes in some morphological indicators of blood in 30-days rabbit puppies born by mothers suffered hypoxia in fetal period. And it influences negative to neuro-endocryne regulation of blood changes.

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