The Role Of Physical Load In The Regulation Of Glycemic Reactions In Blood After Interoceptive Stimulation In Different Functional Situations

Ali.H.Aliyev[1], Parvin.A.Zulfugarova[1], Fatma. A. Aliyev[1] and Ali Arasteh[2]

[1]Department of Physiology, Faculty of Biology, Baku State University, Azerbijan.
[2]Department of Physiology, Maragheh Branch,islamic Azad University, Maragheh, Iran
Corresponding author. E-mail: parvin_1982@mail.ru

Abstract: With respect to the results of investigations, the glucose level in blood in intact animals was different, so in 30 daily animals compared to 90, in 90 daily to 180, in 180 daily animals to annual rabbits and considerably hesitated between 76-127 mg%. Though in light and dark phases in control (norm) in 5, 20 min physical load (work) state, after interoceptive stimulation the increase was observed at glycemic reaction level, but it was higher in dark phase, 20 min physical work, light (day) phase and after 5 min. physical load. It was identified that, in 7-14 days SAU (smell anlyzator upset) short-term physical load caused to increase in glycemic reaction level in 30, 90, 180 and 365 daily animals, but long-term physical load caused to decrease. The reason for all those, is the activation in hypothalamo-hypophysar-adernalo system participating in the regulation of metabolic processes in blood in light phase and the formation of delay after dark regime.
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1. Introduction

The investigation of glycemic reactions in blood during hard muscle activity in humans exposing to physical load influence has been always in scientists' consideration and led to great interest. Various intensive physical load may change the carbohydrate, protein, the exchange of oil for round the clock rhythm, biochemical and physiological indications at various degrees in a short term [1-15]. The mutual correlations between sense organs and neuro-endocrine systems cause rhythmically the formation of active and passive states corresponding to light (day) and dark (night) phases of environment and it joins mainly the epiphysis to the chronometric and biorhythm regulation mechanism of organism [16, 30].

Taking into consideration the up mentioned data, our aim is to investigate "The role of physical load in the regulation of glycemic reactions in blood after interoceptive stimulation in different functional situations".

2. Materials and Methods

For this purpose we have experimentally used the method of physical load influence in our experiments. We have used drum-type, empty, rotating mechanic installation for this purpose. The rotating rate of drum is 40-50 cycle/min. and the rabbits expose to the influence of 5, 20 min. physical load and also 7, 14 daily light and darkness influence.

The investigations were carried out on various aged – 30, 90, 180 and 365 daily (intact and experience) animals. Olphactomia was carried out by Pogrepkova (1972) method. The experiments have been continued after 7 and 14 days. The blood analyses have been taken out of edge vein of animal ear and the glucose in blood was determined within an hour by express method (Bayer-Holding, by glucometer produced by USA and Canada) before and after 1-2 min. irritability of straight intestine receptors by 90-100 mm.Hg (1, 5, 15, 30, 45, 60 min). The experiments on this investigation have been carried out as following series: The first series is the influence of glycemic reaction in control and after interoceptive irritability in various aged animals.

The second series experiments have been carried out to identify the influence of 5, 20 min. physical load (PL) on glucose level in blood after 7 days SAU before and after interoceptive stimulation in various aged animals.

The third series experiments are aimed to identify the influence of 5, 20 min physical load (work) on glucose level in blood after 7 days SAU before and after interoceptive stimulation in various aged animals. The fourth series experiments are aimed to identify the influence of 5, 20 min. physical load on glycemic reaction levels obtained by interoceptive irritability after keeping the various aged animals for 7-14 days in light phase. The obtained results have been statistically carried out by using Fiser-Student and other methods [20, 23], final

mathematic solutions of Pentium-4 personal computer were on the base of EXCEL 7,0 statistic investigation programme.

3. The description and discussion of investigation materials

The results obtained from the first series experiments were presented in Figure 1. As seen from indications (30, 60, 90, 365 daily) in figure the glucose level decreases compared to normal all age groups, but in 7, 14 days after the operation, by the 5 min. physical load influence it increased both in exist phone and after the interoceptive stimulation.

So, in control at 8^{00}-9^{00} the glucose amount in blood in 30 daliy animals was 76±2,57 mg%, but after interoceptive stimulation the maximum change was 75±2,57 mg% ($p<0,01$) in 15 min, in 7 days SAU (figure 1) norm was 69±0,55 mg%, maximum change 78±0,73 mg% ($p<0,001$), in 14 days (fig. 5) after SAU in control was 69±0,99 mg%, maximum 78±0,73 mg% ($p<0,001$), in 90 daily animals in control 85±0,96 mg%, maximum change 92±0,74 mg% ($p<0,001$), in 7 days after SAU (fig. 2) 80±0,80 mg%, maximum change 92±0,47 mg% ($p<0,001$), in 14 days after SAU (fig. 6) 80±1,05 mg%, maximum change 96±0,91 mg% ($p<0,001$), in 180 daily animals (fig. 3) in control was 114±0,80 mg%, maximum change 104±0,58 mg%, in 7 days adter SAU in control was 98±1,71 mg%, maximum change 114±0,99 mg% ($p<0,001$), in 14 days after SAU (fig. 7) 110±1,03 mq%, maximum change 126±0,97 mg% ($p<0,001$), in 365 daily animals in control 127±1,09 mg%, maximum change 114±0,85 mg% ($p<0,001$), in 7 days after SAU (fig. 4) 114±0,82 mg%, maximum change 142±0,82 mg% ($p<0,001$), in 14 days control (fig. 8) 118±0,99 mg%, maximum change was 122±0,97 mg% ($p<0,001$).

According to the obtained data it is supposed that in 7 days after smell analyzator dereceptation both in control and after interoceptive stimulation the glucose level in blood compared to control has decreased both before straight intestine receptor irritability and after it in all aged groups, but in 14 days restore it was close to previous control level.

In fig. 1 have been shown the changes occurring in glucose level in blood within an hour (1, 5, 15, 30, 45, 60 min) in 7, 14 days after smell analyzator dereceptation, 5, 20 min. physical load (work) and before and after interoceptive stimulation.

It is seen from figures that the short-term (5 min) physical load after SAU (smell analyzator upset) in amimals not depending on the age animals and glycemic reaction level in blood caused to increase-hyperglykaemia of glycemic reaction level both in control, and in 7, 14 days after interoceptive stimulation. But these indications caused to decrease-hyperglykaemia in glycemic reaction level in blood compared to 7 days after long-term physical work both in exist and interoceptive stimulation phones.

But comparing the obtained results to control in 7, 14 days SAU before and after straight intestine mechanoreceptors irritability we observe considerable decreased results. So, the physical load (work) effecting the organism and having a certain influence power in blood and daily cyrcad rhythmic dinamics. Thus, the experiments carried on these series give an apportunity to make a conclusion that after SAU in physical load phone in animals, interoceptive stimulation in glucose in blood, the experiment may cause reactions (hyper and hypoglykaemia) depending on the age of animals and term of physical load and can also be evaluated as of the important physiological factors increasing the influence physical load on glycemic reaction interoceptive stimulation.

The aim of our work is to study the changes observing in glucose level in blood in 5 and 20 min. physical work and interoceptive stimulation after keeping various aged animals in light (day) and dark (night) phases for 7 and 14 days, and after determing the glycemic reaction in blood in 7,14 days SAU after short and long-term physical load and interoreceptive stimulation. The obtained results in this area have been given in fig. 1. It is seen from the carried investigations, the glycemic reaction level, after 7 days light regime, in 30 daily animals before smell analyzator function upset in control was 76±2,57 mg%, then 69±0,55 mg% after light 5 min physical load was 72±0,78 mg%, after interoceptive stimulation the maximum change in 7 days before SAU was 86±2,10 mg%, then 72±0,78 mg%, after light+5min physical load the maximum change was 80±1,25 mg% ($p<0,001$). In 7 days in 90 daily animals was as follows.

The glucose level in blood before the operation was 85±0,96 mg%, then 80±0,80 mg%, after the influence light+5 min. physical load was 68±1,74 mg%, the maximum change in 7 days after interoceptive stimulation was 80±0,80 mg% before SAU then 81±0,80 mg% ($p>0,5$), after light+5 min physical load was 68±1,74 mg%. These indications were 114±0,90 mg% in control in 180 daily animals, the maximum change was 140±0,58 mg% in control, in 7 days after SAU at first was 98±0,91 mg%, but then 102±0,55 mg% ($p<0,01$), the maximum change after SAU stimulation was 114±0,99 mg% ($p<0,001$).

In 7 days after SAU light phase+5 min. physical load 90±1,64 mg% and interoceptive stimulation was 86±1,08 mg% ($p=0,05$). The glucose level in blood in 365 daily animals before the operation was 127±1,19 mg% in control, the maximum change 154±0,85 mg%, in 7 days after SAU was 114±0,82 mg%, and after interoceptive

stimulation 132±0,62 mg% (p<0,001), after light phase+5 min. physical load 118±0,90 mg% (p>0,2).

The results obtained in 7 days after SAU compared to upmentioned information it becomes obvious that the changes, related to levels in animals in which smell analyzator upset after 14 days light phase in control and also after interoceptive stimulation have been observed.

It is also seen from fig. that in rabbits kept 7 days in darkness in control also compared to SAU animals, and also before of 1-2 min. term irratability receptors different changes were observed. So, in control in glucose level of blood compared to control decreases, after interoceptive stimulation compared to 7-14 days light phase, the maximum change in glucose level of blood was weak within 15-30 min. observation. We continue our experiments on the sphere of influence to glycemic reaction levels in 7 and 14 days after SAU after light and darkens phases, and after determing the influence of 5 min. short-term physical work on glucose level in blood before and after interoceptive stimulation, and in 7 and 14 days after 20 min. long-term physical load SAU, after light and darkness phases. Obtained results have been given in fig. 1.

It is seen from given data in the fig. that in 7-14 days the glycemic reaction level at first was 76±2,57 mg% in 30 daily animals in 7 days after SAU was 69±0,99 mg%, but in 7+20 min physical work after SAU was 59±2,90 mg%, the maximum change after interoceptic stimulation in 7 days after SAU was 59±2,90 mg%, in 14 days SAU 74±0,60 mg%, after SAU in 14+Lph+20 min physical load was 60±0,47 mg%. In 7 days after SAU in 90 daily animals was 80±0,80 mg%, before SAU 7+Lph+20 min. physical load was 70±2,01 mg%, then 74±0,71 mg% (p>0,001), after interoceptive stimulation SAU before 7+Lph+20 min. physical load was 70±2,01 mg%, then 74±0,71 mg% (p>0,01). These indications after 14 days SAPhU was 80±1,05 mg%, after 14+Lph+20 min. physical load SAPhU was 64±1,67 mg%, after interoceptive stimulation, the maximum change in SAU was 68±0,73 mg% (p=0,05), after SAU 14+Lph+20 min. physical load was 64±1,67 mg%. In 180 daily animals 30 and in 90 daily animals in 7 days SAU in light regime, after SAPhU 7+98±0,91 mg%, before SAU+Lph+20 min. physical load was 92±2,47 mg%, then 90±0,82 mg% (p>0,5), after interoceptive stimulation the maximum change in SAU 7 was 114±0,80 mg% (p<0,001), but after SAU 7+Lph+20 min. physical load was 90±0,82 mg% (p>0,5), after SAU 14+Lph+20 min. physical load was 88±3,56 mg% (p>0,5). After 7 days SAU in 365 daily animals the glycemic reaction levels in blood was 114±0,82 mg%, after SAPhU 7+Lph+20 min. physical load was 120±1,17 mg% (p<0,001), in 14 days SAU 14 118±0,97 mg%, SAU 7+Lph+20 min physical load was 84±0,78 mg%.

In animals irritabilated with Hg column straight intestine recetors are 90-100 mm, the maximum change occurring in glucose level in blood after SAU 7 days was 142±0,82 mg% (p<0,001), after SAU 7+Lph 20 min. physical load being 132±0,91 mg% (p<0,001), in SAU 17 days was 144±0,69 mg% (p<0,001), after SAU 14+Lph+20 min. physical load was 99±0,88 mg% (p<0,001). So, in animals kept in light phase 7, also 14 days after SAU, after 20 min. physical load both in exist phone, also after interoceptive stimulation the glycemic reaction level compared to control statistic corresponding indications showed hyperglykaemia in control, but after SAU 7-14 days hypoglykaemia happened. The results, obtained from the carried experiments in light and dark phases have been presented in fig. 1.

In fig. after SAU light and dark phases, in various aged animals in 20 min. physical load before and after interoceptive stimulation, it becomes clear from the influence to glycemic reaction levels that the glycemic reaction levels in blood becomes higher because of the lack of delayed influence in darkness phase in hypothalamo-hypophysar-adernalo system playing an important role in glucose normal level in blood in light (day) phase by retinohypotalamo method of epiphysis melaton hormon increasing the synthesis in dark phase. On the contrary, in dark regime, because of restore of delayed-influence on hypothalamo-hypophysar-adernalo system of melatonin in dark regime, after SAU 7, 14 days in various aged animals kept in dark phase in blood glucose level decreased according to the age.

On condusion, in one and 3 monthly animals the glycemic reaction level before interoceptive stimulation in the morning was six, compared to 12 monthly animals was less, then in all aged group animals though the results were different from each other (in little aged groups less) the increase was observed.

It was indentified that both in control and in experience animals in normal after 7-14 days light regime the glycemic reaction level increased, after dark (night) regime decreased. These indications after 7-14 days of dereceptation of medium part smell analyzator, the glycemic reaction level in control and also after interoceptive stimulation compared to intact animals after 14 days though the restore was observed, but it was less.

In all age groups in control, experienced also in light and dark phases before and after interoceptive stimulation the glucose level in blood, after short-term physical load influence exposed to hyperglykaemia after long-term physical load

exposed to hypoglykaemia. The reason for all these is the formation of activity in the function of hypothalamo-hypophysar-adernalo system participating in the regulation of metabolic processes in blood in light (day) phase, and delay in dark phase.

After SAU 7, 14 days in light (LPh) and dark phases (DPh) of various aged animals the influence 5 and 20 min. physical load, interoreceptors irritability on glycemic reaction levels (ml, mg%) M±m, n=6.

1-SAU 7day LPh; 2-SAU 7day LPh+5 min. pL;
3-SAU 7day DPh; 4-SAU 7day DPh+5 min. pL;
5-SAU 14day LPh; 6-SAU 14day LPh+5 min. pL;
7-SAU 14day DPh; 8-SAU 14day DPh+5 min. pL

Fig. 1.

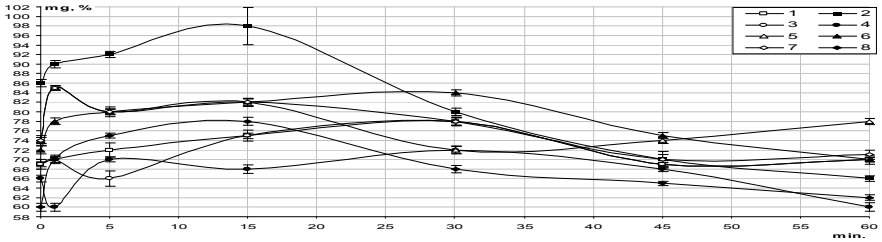


Fig. 2.

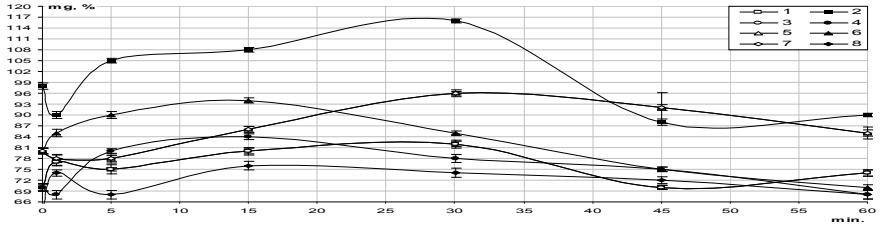
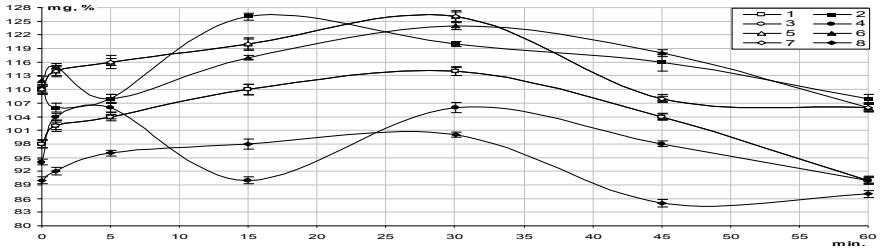


Fig. 3.



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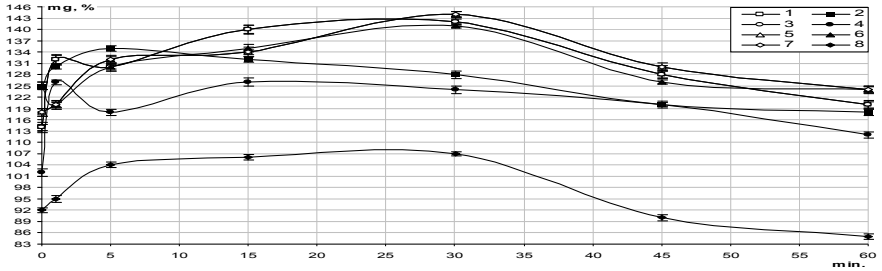


Fig. 5.

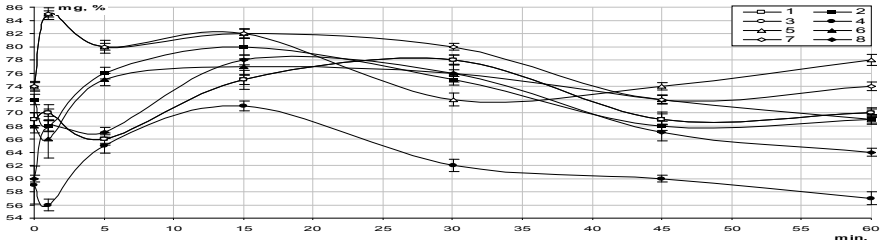


Fig. 6.

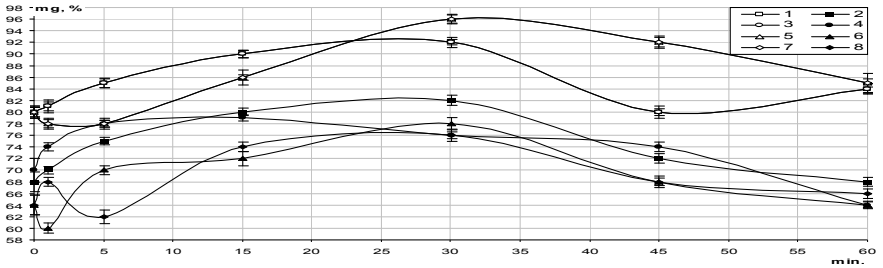


Fig. 7.

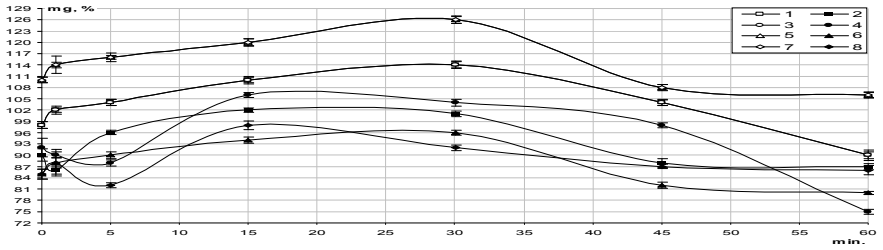
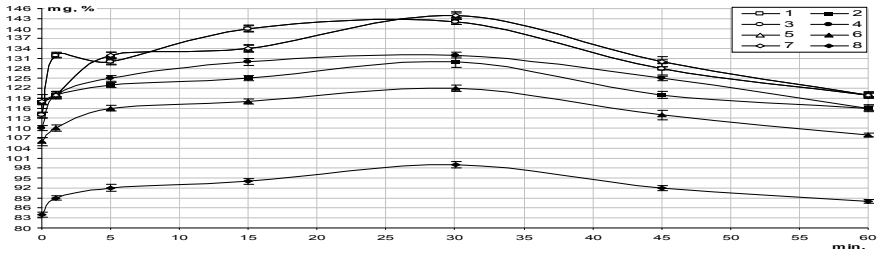


Fig. 8.



Corresponding Author:
Ali H. Aliyev
Department of Physiology, Faculty of Biology, Baku State University, Azerbijan.
E-mail: parvin_1982@mail.ru

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