



Exercise Biochemistry Review

Proceedings of IBEC 2018, Beijing, China, October 23-25
PO-045

Effect of Hypoxic Pre-conditioning and Altitude Training on CD55 and CD59 Expressions of Swimmers

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Objective By studying the swimmer after preconditioning during altitude training again after the change of erythrocyte immune and immune function, summarizes the change law of erythrocyte immune to try on erythrocyte immune to the connection between the immune index, further perfect the study on hypoxic training for athletes erythrocyte immune level, provide help and reference for scientific plateau training, comprehensive monitoring the immune function, so that more clear understanding of the athlete's body function condition, effective judgment level of fatigue, for the early diagnosis of overtraining and training plan of reasonable adjustment has important significance.

Methods . Subjects: 8 first-line swimmers in Shanghai, aged 16.9 + 3.5 years. 2. Hypoxic training program: the 3-week hypoxic training was conducted in the east green boat hypoxic training laboratory with a starting height of 1500m and a height of 2200m after 3 days. Sleep from 19:00 PM to 6:00 am in the hypoxic laboratory six days a week. Day training in an aerobic environment. 3 days after the end of hypoxic training, I went to kunming (2,200m) for 3 weeks of altitude training. After the highland training, go to the field to prepare for the competition. 3. Test indicators: RBC immune indicators CD55, CD59; Functional status indicators RBC, HGB, HCT; Test time: 1 week before hypoxic start, 1 week before hypoxic start, 1 week after hypoxic end (i.e. before plateau training start), and 4 times of day elbow-venous blood taken at the end of altitude training was used for testing. $P < 0.05$ indicates a significant difference, while $P < 0.01$ indicates a very significant difference.

Results It was founded that: 1) The CD55 levels of the swimmers increased 0.56% at the 10th day, decreased 2.74% at the 3rd week and increased 9.89% 1 week after hypoxic pre-conditioning training. 2) The CD59 levels of the rowers revealed the similar changes as the CD55 during hypoxic pre-conditioning training. 3) The CD3 decreased by 4.13% and CD4/CD8 by 2.4% at the 1st week after hypoxic pre-conditioning training. 4) Compared with normal altitude training, CD55 and CD59 were kept in a high level in the third week of altitude training. CD59 of this week was lower than last two weeks. 5) WBC of the first hypoxic training week increased a little, and then, it come down in the next two weeks. In the third week of altitude training, WBC has gone up again. Three white cell subsets have different reaction. This result is similar with other researches.

Conclusions These results suggest that the effect of our altitude training method takes a different stimulation compared with normal altitude training. Mainly presented: 1). The expressions of CD55 and CD59 increased after hypoxic pre-conditioning and altitude training. 2). The erythrocyte immunity was more sensitive to the hypoxic training. CD55 and CD59 kept in a high level in the third week of altitude training. CD3 increased also. These showed that three weeks hypoxic training accelerated the adaption to altitude training. It suggested that our method took good effects on improving physical functions in altitude training period.