Monitoring and evaluation of Zhejiang Swimmers' Altitude Training

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Objective (1)Through the blood physiological and biochemical tests during the altitude training, to analyze the body function of swimmers in this stage.(2) Through the individual lactate threshold tests before and after the altitude training,to analyze the effects of altitude training.

Methods Eight swimmers took a 26-day altitude training session.The individual lactate threshold test was carried out by the Swedish Monak839E power cycle progressive loading method before and after the training;During the altitude training period, 5ml of the subjects' elbow vein was extracted and tested on an empty stomach and in a quiet state every Monday morning.

Results (1)When swimmers reached the plateau, the hemoglobin value was indistinguishable from the plain(male 156.2±7.01，female 135.7±8.75g/L),From the hemoglobin value (male 154.03 + 5.67, female 134.23 + 9.66g/L), there was a decrease in both male and female in the second week.But hypoxia stimulated red blood cell production, and the body itself was gradually adapting to the training load.Thus, the hemoglobin value of the third week (male 157.17 + 3.7, female 141.93 + 10.06g/L) was significantly improved, and higher than the level of the first week.During the altitude training period, the mean value of male's blood testosterone was 474.33 + 97.06ng/dl, and the female's blood testosterone was 33.67 + 17.25ng/dl.Male's blood testosterone was lower than the mean of the national team, because the study participants were youngers who were not fully developed and had shorter training years.There were different trends in blood testosterone value between male and female. Male's blood testosterone values during the Monday morning of these three weeks were 479.67±76.25 、 492.33±83.61 、 451±153.41ng/dl respectively.female's blood testosterone values during the Monday morning of these three weeks were 29.33±21.83、32±23.26 、39.67±9.29ng/dl respectively.These further indicated that this altitude training plan was more suitable for male with shorter training years, and the body had certain fatigue accumulation, but the decrease range was within a reasonable range.However, the increase of blood testosterone per week in female indicated that the training stimulation depth was not enough, and the potential of athletes should be further explored.According to the changes of creatine kinase, the sensitivity of male to the change of altitude training intensity was also shown, and the highest value of creatine kinase was 731U/L in the first week.(2) From the value of the individual lactate threshold before and after altitude training, no matter male or female,the change was not obvious, but was generally improved, this may be the altitude training adopted the pattern of three and a half weeks, training time was short.Secondly, as a professional athlete, the "plastic space" gradually decreased with the extension of the training years.Most of the peak blood lactate occurred in 1-3 minutes of recovery period.and the average value increased from 8.96 + 1.86mmol/L before altitude training to 9.99 + 1.47mmol/L.Among them, the peak value of male's blood lactate was increased from 8 + 2.22mmol/L before the altitude training to 10.91 + 1.43mmol/L, and there was a significant difference in the peak of blood lactate before and after the altitude training.However, the peak value of female's blood lactate was decreased from 9.92 + 0.79mmol/L before the altitude training to 9.07 + 0.88mmol/L. This was mainly due to the fact that a member of the swimmers had caused the result, and this swimmer's enduring lactate level was lower than the one before the plateau.

Conclusions The altitude training generally improved athletes' training ability, but based on factors such as training age, gender, should be targeted according to the individual situation of each athlete training plan, so as to achieve more from less.