



## Exercise Biochemistry Review

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### Application of biochemical index monitoring in Chinese hearing-impaired table tennis team

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**Objective** Using the theory of sports biochemistry, we can better complete the formulation of the training plan, the evaluations of training effect and the athlete's fatigue status, the real-time monitoring of training intensity and training amount as well as the function level of athletes and the comprehensive evaluation of nutritional status. To provide some theoretical guidance for the daily training of Chinese hearing-impaired table tennis team and to gradually establish the biochemical monitoring model for the Chinese Deaf Table tennis team, this subject has applied biochemical index monitoring to this team.

#### Methods

##### 2.1 Research Object

8 Athletes (male 4 female 4) of the Chinese hearing-impaired table tennis team were studied. The average height, weight, and age were  $174.3 \pm 5.1$  cm,  $65.4 \pm 11.6$  kg,  $23.5 \pm 4.9$  years respectively.

##### 2.2 Research Methods

###### 2.2.1 Literature

To find out the energy-supplying and metabolic characteristics of table tennis as well as the modes to accelerate the recovery period of body fatigue, we have searched a variety of literature on this purpose. The investigation of athletes' nutrition regulation, physical training and rehabilitation and other related research results lays a good foundation for the implementation of the project.

###### 2.2.2 Expert Interview

This paper discusses the energy metabolism characteristics of the hearing-impaired table tennis players by discussing with the coaches, athletes and experts and scholars of the national Hearing Impairment project group. The evaluation index and standard of athlete's body function, the method of training load monitoring, the way of nutrition regulation, the means of fatigue recovery and the process of physical training were discussed.

###### 3.2.3 Field Investigation

From April, 20th, 2017 to July, 10th, 2017, two researchers have long been in the center of national table tennis training located at Zheng Ding, Hebei province, to complete training monitoring and research services.

#### Results

##### 3 Research Results

Phlebotomizing 7 of the Chinese hearing-impaired table tennis players in June, 2nd, 2017 and June 7th, 2017 respectively, The blood samples were analyzed by the team of experts and researchers in the Sports Physiology and Biochemistry Laboratory in Beijing Sport University. Part of the results was shown below in table 1, table 2.

###### (1) Training intensity monitoring

Huang Mengping had a slightly higher creatine kinase, a slight decrease in testosterone, a slight rise in cortisol, a lower testosterone/cortisol value, as well as an insignificant reduction in body function than

*the previous time. She should focus on the recovery of her body condition after training. In general, the testosterone, cortisol and testosterone/cortisol level in this team is slightly higher than the last time, blood urea lower than the previous. Strengthening the monitoring of exercise and nutrition and continuing to maintain a high body synthesis ability are favorable to intense competition. The overall creatinine level decreased, whereas 4 members of the team had insignificantly high creatinine, especially for Huang Mengping who first had appeared high level of it. Although this condition was not too severe to focus on, we should strengthen the regulation of athlete muscle injury and protect their kidney functions.*

#### ***(2) Monitoring of endocrine system indicators***

*Both males and females had higher testosterone synthesis capabilities. They should continue to take the nutritional supplements. The T/C ratio of Tian Jiping has escalated sharply, but it was lower than that of other players. We should pay attention to his training load and promote the recovery training.*

#### ***(3) Monitoring of Iron Metabolic Index***

*Huang Mengping's hemoglobin value and RBC value have been slightly elevated this time. It is suggested that she should keep on to take nutritional supplements and strengthen aerobic endurance training. Hemoglobin for Wang Zhe and Lin Huan (slightly decreased this time) was higher than their counterparts. The ability to transport oxygen was excellent, and it is agreeable to keep on. They need to continue to maintain and promote the body's oxygen reserve capacity. At the same time, they can also upgrade their overall red blood cell levels. Men have seen a high level of hemoglobin and the number of red blood cells as well as robust capabilities of oxymoron reservation and transportation. It is recommended to enhance aerobic endurance training, mainly improving the aerobic capacity. The serum iron of Tian Jiping was promoted quickly. He needs to build up the amount of iron nutrient intake and support the body synthesis. The full iron metabolic indicators were normal, but Zhang Chaoyue and Lin Lin Huan have been seen the lack of the abilities to synthesis iron. So we need to pay attention to iron metabolism-related nutrition intake. In general, iron protein level and the capability to reserve iron have declined. It is recommended to take more iron nutrients, Especially for Shi Ce.*

#### ***(4) Food surveillance***

*After the diet regulation, the indicators for the team's blood fat were within the normal range. Zhang Chaoyue and Wang Zhe should control the high-fat food intake, thus reducing the amount of low-density lipoprotein.*

#### ***(5) Surveillance of immune Indicators***

*The white cell, blood cell classification and immunoglobulin (IgG, IgM, IgA) of the team are all normal, Wang Zhe's immunoglobulin A and Xu You's immunoglobulin M are slightly low, we should pay attention to protection.*

#### **Conclusions**

*Through the overall monitoring and analysis of the biochemical indexes of the leading athletes of Chinese hearing-impaired table tennis team, The characteristics of biochemical indexes of the high-level hearing-impaired table tennis players are mastered. On the basis of the overall characteristics of the individual, we carried out personalized monitoring and evaluation to give coaches and athletes advice on training, rehabilitation and other aspects related to practice. Biochemical tracking in China's hearing-impaired table tennis team has achieved an excellent application results that have been unanimously recognized by the coaches and athletes.*