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Interval training as a means of maintaining a high level of performance of athletes in conditions of high ambient temperature.

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## INTRODUCTION:

This study aimed to investigate the effects of hyperthermia on physiological parameters of a high-level athletes at rest and during exercise of varying intensity. The study was conducted in a laboratory setting and results were tested under real conditions of increased environmental temperature at training camps in Brazil. Physiological parameters were measured at rest, at the aerobic threshold, anaerobic threshold, maximal power output and during submaximal exercises. The results of this study have important implications for athletes competing in the upcoming Olympics in 2024 and 2028, as the ambient temperature during the competition will be high [1,2,3].

METHODS:

86 highly qualified team sports athletes were tested to determine VO2max and maximum alactic power. Testing was performed on Ergoline 200 and Monark 894E bicycle ergometers using a Cortex Metamax 3B gas analyzer. To simulate the conditions of hyperthermia, the subjects entered the sauna (t=90-95°C, humidity <10%) until the temperature of the core of the body increased to 38-38.5°C. The temperature was measured in the ear with the "TermoScan" device (p<0.1°C). After that, the subjects performed a load on a bicycle ergometer at room conditions (tk = 25.3 °C) with a load of varying intensity. The results obtained were tested on 15 athletes of the countrys national rugby-7 team in Brazil at an ambient temperature of 33-35 °C during training and competitive exercises. Athletes were measured core body temperature, the concentration of lactic acid in capillary blood, the subjective state of the athlete was assessed, the intensity of the exercise was recorded using Catapults GPS performance tracking system monitors, measuring heart rate (HR) and heart rate variability (HRV). RESULTS:

When performing a load at the level of the aerobic threshold and below, the core temperature of the athletes body decreases. Performing a load at the level of the anaerobic threshold (AT) leads to a faster achievement of the maximum temperature of the body core (40-40.5 °C) and, as a result, reduces the duration of the load with the AT power by 40-50% and an increase in heart rate at the AT level by 30±4 bpm. With an increase in body temperature, the maximum duration of the exercise with submaximal power decreases by 15% (p<0.001), while the indicators of maximum strength and power increase by 7% (p<0.001). CONCLUSION:

The temperature of the core of the body after heating to 39 - 40 °C can be significantly reduced when performing work with a power below the aerobic threshold. Performing a rest interval with power at the level of anaerobic threshold and above leads to the accumulation of heat in the body of athletes. Therefore, the interval method of training with the performance of speed and speed-strength exercises and active rest intervals, with power below the aerobic threshold, will allow organizing effective training sessions in a hot climate, while maintaining the high performance.

Topic:

Physiology

Presentation

Poster

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