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Health evaluation of the human body under hot and humid environments: A study based on the neurophysiology and neuroethology

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Hot and humid environment is an extreme environment, the air temperature and humidity of which are usually beyond the thermoregulatory limitation of the human body which are greatly increasing the health risks such as dehydration, heat stroke, shock or even death. In order to evaluate the health status of the human body under hot and humid environments, six healthy male subjects were recruited and seated in an environmental chamber and the heart rate variability were adopted to analyze the variations in the balance of the autonomic nervous system (β), under resting, light and moderate activities. Meanwhile, the thermal sensation scale and the cognitive test (BPR-5) were also selected to study the changes in subjective feelings and cognitive ability. Based on that, health status of the human body was then comprehensively analyzed. Results showed that the value of β elevated significantly as the activity intensity increased, along with the increase in the absolute value of the thermal sensation scores, as well as the increases in the response time and the reduction of the accuracy during the BPR-5 test. In addition, the mean value of β of all subjects could be controlled within two if the intermittent air supply with a speed of 0.35 m/s was selected, leading to shorter response time and elevated accuracy during the BPR-5 test and the air supply frequency of the intermittent air supply was positively correlated with the activity intensities of the subjects. Finally, the scaled evaluation of the human health under hot and humid environments was established based on the results above. Findings of this research confirmed that the health status of the human body is closely related to the neurophysiological and the neuroethological indices. The intermittent air supply is a good way to ease the health inadequacy of the human body under hot and humid environments.

Biography

Hui Zhu has completed his PhD at Central South University of China. Currently he is working at the University of South China as a Doctoral researcher and his present research interests are thermoregulation and health assessment of the human body under different environments, especially the extreme environments. He has published more than 20 papers in reputed journals in recent five years and has been serving as a peer reviewer of several journals. In addition, he is also working as the Project Leader of a Natural and Scientific Project of Hunan Province, as well as the Leader of a Natural and Scientific Project of Local Government.

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