先端科学技術研究科 修士論文要旨

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要旨

Heat illness is a spectrum of disorders of physical adaptation caused by environmental exposure to heat, and causes a large number of emergency transport. According to epidemiological data, the number of deaths due to heat stroke shows increasing trend due to aging and global warming. One of the reasons why the number of cases has not decreased is that heat illness is a complex condition. The involvement of autonomic dysfunction is known to be a risk factor for heat illness, and the changes of the autonomic nervous system activity are reported under heat stress or heat illness. However, there is no study that report the change of autonomic nervous system activity by heat illness under usual activity with the sufficient number of subjects. In this study, we examined whether there are changes in the autonomic nervous system before and after the onset of heat illness from the baseline using the heart rate variability (HRV) indices.HRV data were collected from workers at steel mills where heat illness can occur during their works, and exerciser. As a result, there was a significant difference in sympathetic nerve indicator from 10 minutes before the onset of heat illness. In addition, there was a significant difference in the parasympathetic nervous system indicators from 5 minutes before the onset of heat illness. A potential new hypothesis of the mechanism of heat illness is that the sympathetic nervous system's resistance to heat stress breaks down, and the parasympathetic nervous system becomes active, resulting in the development of heat illness. Further verification including laboratory experiment is necessary to unveil the pathological mechanism of heat illness.