一日一定時間帯に限った暑熱負荷によるヒトの体温調節機構の変化

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雑誌名	平成9(1997)年度 科学研究費補助金 基盤研究(C) 研究成果報告書概要
巻	1996　1997
ページ	2p.
発行年	1999-03-15
URL	http://doi.org/10.24517/00066133

1997 Fiscal Year Final Research Report Summary

Changes in thermoregulatory functions of humans after scclimation to heat given daily at a fixed time.

Research Project

Project/Area Number

08670077

Research Category

Grant-in-Aid for Scientific Research (C)

Allocation Type

Single-year Grants

Section

一般

Research Field

Environmental physiology (including Physical medicine and Nutritional physiology)

Research Institution

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Project Period (FY)

1996 – 1997

Keywords

heat acclimation / circadian rhythm / sweating / thermoeffector threhsolds

Research Abstract

The present project investigated thermoregulatory functions of humans subjected to heat exposure for several hours limited to a fixed time daily.
The food ingestion and sleep-awake cycle of volunteers were controlled throughout the experiments. For heat accliamtion, the subjects were exposed to an ambient temperature (Ta) of 46°C for 4 hrs (14：00-18：00 h) daliy.
Experiment 1：Core temperature (Tcor) of the subjects were measured for 24 h at a constant Ta of 27°C with or without heat acclimation. The pattern of day-night variations of Tcor was altered by heat acclimation, i.e., the Tcor levels were maintained at low levels in the afternoon.
Experiment 2：The subjects were seated in a chair at Ta of 28°C.Both legs were immersed in a warm water and sweating was induced. The procedure was repeated twice in the day, once in the morning and once in the afternoon, before and after heat acclimation. The latency for thermal sweating was shortented and the threshold Tcor for sweating was lowered by heat acclimation only in the afternoon.
The results give evidence that in humans, repeated heat exposure limited to a fixed time daily lowers Tcor and alters thermoregulatory functions during the period when the subjects were previously exposed to heat.

Research Products (7 results)

All | Other

All | Publications (7 results)

[Publications] O.Shido et al.: "Body core temperature of rartssubjected to daily exercise at a fixed time." Int.J.Biometeor.40. 135-140 (1997)

[Publications] O.Shido et al.: "Thermoeffector thresholds and preferred ambient temperatures of the FOK rat." Am.J.Physiol.(in press). (1998)

[Publications] O.Shido,: "Can our thermoregulatory system anticipate temperature exposure?" Medical hypotheses.(in press). (1998)

[Publications] 紫藤 治: "暑熱環境への適応-体温調節機能の変化" 地球環境. 2(印刷中). (1998)

[Publications] O.Shido et al.: "Body core temperature of rats subjected to daily exercise at a fixed time." Int.J.Biometeor. 40. 135-140 (1997)

[Publications] O.Shido et al.: "Thermoeffector thresholds and preferred ambient temperatures of the FOK rat" Am.J.Physiol.(in press). (1998)

[Publications] O.Shido: "Can our thermoregulatory system anticipate temperature exposure?" Medical hypotheses. (in press). (1998)

URL: https://kaken.nii.ac.jp/report/KAKENHI-PROJECT-08670077/086700771997kenkyu_seika_hokoku_

Published: 1999-03-15