1-7 Comparison of Thermoregulatory Responses between Normal Temperature and Cold

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The difference of thermoregulatory responses between normal temperature and cold was observed. The subjects were 18 adult females (21.5 yrs, 158.9 cm, 52.3 kg). At the start, they were exposed to 24°C (RH50%) for 30 minutes (N1), secondly to −30°C for 20 minutes (C) and 24°C again for 40 minutes (N2). They kept a sitting position. The clo value was 0.18 for N1, N2 and 2.0 for C. Measurement items were rectal temperature (Tr), skin temperature (Tsk), oxygen uptake (VO_2) and subjective sensations. We determined *atsugari* (susceptible to the heat) and *samugari* (susceptible to the cold) according to the subjective sensations during N1. *Atsugari* showed lower Tr and higher Ts than *samugari* in N1. The order of Tr and VO_2 of two groups in N1 was maintained in C, however Tsk and subjective sensations were not. We guessed that the latter items were reset by cold exposure.

1-8 Thermal Swimsuits Attenuate Body Temperature Decrement and Cold Sensation of Prepubescent Children in Cool Water Environment

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This study investigated thermal swimsuit (TSS) effects on body temperature and thermal sensation of prepubescent children during moderate-intensity water exercise. Nine prepubescent (11.0±0.7 yrs) were immersed in water (23°C) and pedalled on an underwater cycle-ergometer for 30 min with a TSS or a normal swimsuit (NSS). The T_{re} were maintained slightly higher with TSS than NSS. The ΔT_{re} and ΔT_b in NSS condition were correlated with % body fat, which indicated that subjects with low body fat had a thinner insulation layer than obese subjects, and tend to decrease body temperature. However, subjects with lower body fat could maintain T_{re} as like as obese subjects by wearing the TSS. In addition, subjects with TSS showed warmer thermal sensation and thermal comfort than with NSS. From these results, the TSS could be useful to maintain body temperature and to keep on learning comfortably during swimming class in cold water. Especially TSS seemed to be advantageous for subjects with lower body fat to compensate for the thinner fat layer.

1-9 Thermoregulatory Responses Affected by the Combination of Air Temperature and Wet Revel of Clothing

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The purpose of this study was to observe the thermoregulatory responses while wearing wet clothing. The subjects were eleven healthy adult women. The climatic chamber was controlled at 20, 25, 30°C, and relative humidity was fixed at 80%. The clothing styles were sweat shirts and pants (S), and T-shirts and short pants (T). Five conditions (30S, 30T, 25S, 25T, 20S) were prepared. The wet conditions of clothing were categorized into three states, namely D (dry state), W1 (damp state) and W2 (soaked state). The rest and work periods were prepared for each wet condition. The main results were as follows: 1) When wet clothing was worn at 30°C, it was possible to minimize the thermal stress by adjusting the clothing style. 2) When wet clothing was worn at or below 25°C, the cold stress might have occurred for light clothing. 3) Whether the clothing condition was dry or wet, Tsk was about 33°C for the neutral thermal sensation. 4) The distinctive feature of wet clothing condition was that Tsk decreased remarkably when the thermal sensation shifted to the "cold" side.

1-10 The Effect of Hyperventilation on Reduction of Cerebral Blood Flow Induced by the Increase in Body Temperature

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It is considered that the reduction of cerebral blood flow (CBF) during hyperthermia related to the reduction of central blood volume induced by cutaneous vasodilation. However it is possible that the reduction of arterial partial pressure of CO_2 induced by hyperthermia-induced hyperventilation reduces CBF. We examined the relationship between CBF response and the ventilatory response during heating at rest, and measured esophageal temperature (T_{es}), heart rate (HR), blood pressure, minute ventilation (VE), end-tidal partial pressure of CO_2 ($PETCO_2$), and middle cerebral artery mean blood flow velocity (MCA V_{mean}). During heating, T_{es}, HR, and VE increased, while $PETCO_2$ and MCA V_{mean} decreased. Further, we calculated T_{es} threshold for these responses. T_{es} thresholds for VE, $PETCO_2$, and MCA V_{mean} were 37.8±0.1°C, 37.7±0.1°C, 37.7±0.2°C, respectively. There were no significant differences among them. These results indicate that the responses of VE, $PETCO_2$, and MCA V_{mean} changed almost at the same T_{es}, and suggest that the reduction of CBF during hyperthermia is induced by not only the reduction of central blood volume, but also hyperventilation.

1-11 Evaluation of Indoor Thermal Comfort in Vehicles in Summer using an Actual Cabin

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