AI06 The Effects of Air Velocity Fluctuation on Skin Blood Flow Response

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Increasing coefficient of heat transfer of air flow with increased turbulence intensity, heat loss at skin surface would be increased. However vasoconstriction at skin would be intensified by dynamic response of cold receptors to turbulence of air flow. In this study air flow with turbulence intensified(the Fluctuated Flow) and air flow with turbulence not intensified(the Normal Flow) of an electric fan were physiologically evaluated under the equalized mean velocity(1.72 and 1.79m/s). The turbulence was defined as the standard deviation of the air velocities(0.69 and 0.26). The heat transfer value from the core to the surface of human body was estimated as the index by using the mass of blood flow, core temperature and skin temperature measured from 9 elder subjects ranged in age from 65 to 69. They were exposed to the air flow for 40 minutes after 90 minutes acclimation. The subjects were seated in a chair located in front of the electric fan. Ambient temperature had been controlled at 30℃ until the exposure began. The air conditioner was stopped as soon as the electric fan turned on. As the result of this study the heat transfer value to the Fluctuated Flow was 91% of the value to the Normal Flow. Therefore it is considered that the Fluctuated Flow reduce undesirable heat loss of human better than the Normal Flow.

AI07 Skin Blood Flow during Cold-Induced Vasodilation

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It is well known that the skin temperature is proportional to the skin blood flow. However, the value of skin blood flow measured by Laser-Doppler flowmeter(LDF) fluctuates owing to the slight movement of probe. Because the measurement area of LDF is only 1mm³ of subcutaneous tissue. Then we took an interest in the relation between the skin blood flow measured by LDF and cold-induced vasodilation(CIVD). At first, high blood flow point(point H) and low one(point L) were chosen. The property of temperature dependence differed between point H and point L. The disappearance of the pain was in agreement with the abrupt increase in value of point H, and it seemed that point H was affected the open or shut of arteriovenous anastomoses.

AI08 Effects of Cold Spot Density in the Hand on Local Thermal Sensation and Skin Blood Flow during Change in Hand Temperature.

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To investigate the effects of cold spot density in the hand on local thermal sensation and skin blood flow during change in hand temperature. Eighteen subjects were divided into three groups with cold spot densities in the hand. They immersed their one hand into the water bath at a temperature(Tw) of 20℃ to 40℃. Subjects who had higher density of cold spots showed as following characteristics, 1) having lower density of warm spots, 2) showing higher sensitivity of local thermal sensation and higher sensitivity of skin blood flow at 20℃ to 34℃ of Tw. 3) showing higher level of skin blood flow at 20℃ to 34℃ and 34℃ to 40℃. These results suggest that cold spot denstiy in the hand is a significant factor for the variation of local thermal sensation and skin blood flow.

AI09 Using the portable lactate analyzer (ACCUSPORT) for the lactate test in competitive swimming

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The purpose of this study was to examine the benefits or disadvantage using the portable lactate analyzer (ACCUSPORT) to lactate test in competitive swimming. Eleven trained female college swimmers participated in this study. The lactate test was conducted at four different swimming speed. Blood samples were taken from finger tip 3 and 5 min after each test. The samples analyzed in duplicate with the portable lactate analyzer (ACCUSPORT, Boehringer Mannheim Co.). It is demonstrated that preparation for measurement and a evaluation between subject was easier with the portable lactate analyzer than with the non portable lactate analyzer. However, because subjects suffer a few pain for collecting blood samples, user must consider to collect blood samples and evaluate samples accordingly.

AI11 Effects of exercise and nutrition on body composition and bone mass density in sportswomen.

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To investigate the relationship between exercise habit and health in sportswomen,147 female college students major in physical education or nutrition(control) were used as subjects. Bone mass density at the calcaneal area was measured by an ultrasound densitometer(Achilles,Lunar Corp.). Body composition was measured by bioelectrical impedance analysis.Nutrient intake and energy consumption were obtained by food intake survey and time study for 3days in the dormitory.The stiffness index of the sportswomen group was significantly higher than those of the control group.There were significant correlations between stiffness and lean body mass(p<0.001). Body fat percent of the sportswomen group was significantly lower than those of the control group.Energy intake of sportswomen group was insufficient as compared with the energy consumption. It was suggested that Nutrient intake from between meals is necessary especially in sportswomen.

AI12 Hysteresis Effects in Various Work and Environmental Conditions

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The purpose of this study is to clarify the hysteresis of physiological phenomena in work physiology. Six healthy female subjects performed the 20 minutes step test twice. The measurement items were rectal temperature, heart rate, oxygen uptake, and thermal sensations. The influences of rest period (30, 70 and 160 min), work intensity (40 and 60% of VO2 max) and ambient temperature (20 ℃ and 30 ℃) were examined. The greatest effect was observed in the combination of 30 minutes rest period and 30 ° C between the first and second work. However, there was not seen the significant correlation statistically in the regression analysis.