

YASUNAGA

Department of Living Environmental Science, Fukuoka Women's University

Negative air ions (NAI) are plenty in the high humid air. An air conditioner produces a high concentration of NAI independent of levels of air humidity. This study aims to clarify the physiological and subjective responses to NAI in the heating (low air humidity) and cooling (high air humidity) conditions. Twenty young females were exposed to high (8000–10000 pieces/ml) and low (less than 100 pieces/ml) concentrations of NAI in summer and winter. Air temperature was kept at 25°C and air humidity levels were 70% in summer, 40% in winter, respectively. Blood pressure, heart rate variability (HRV) and subjective evaluations of environment were measured during the exposures. A significant difference was found in HF components of HRV in the interaction of NAI and season, the HF component was higher in the high NAI concentration in summer. LF/HF ratios of HRV were significantly higher in summer, but not different in NAI levels. Subjects evaluated their environments as “poor” in summer, but not different in their evaluations between high and low NAI concentrations. These results suggest that effects of NAI on humans are influenced by levels of air humidity.

1-8 Heat Loss and Insulation Changes by Wearing a Thermal Swimsuit during Water Immersion

Hitoshi WAKABAYASHI¹⁾, Atsuko SUGANO²⁾ and Takeo NOMURA²⁾

1) Doctoral Program in Health and Sport Sciences, University of Tsukuba, 2) Institute of Health and Sport Sciences, University of Tsukuba

The purpose of this study was to clarify the heat loss and insulation changes by wearing thermal swimsuit (TS) during 60 min water immersion. Ten healthy male subjects wearing either TS or normal swimsuit (SS) immersed in water (26°C or 29°C). Esophagus temperature (Tes), skin temperatures and expired gas were measured during experiments. Metabolic heat production (M) was calculated from expired gas. Total heat loss (Hs) was calculated from M and the change in mean body temperature during water immersion. Total insulation (Itotal) and tissue insulation (Itissue) were derived from $Tes - Tw$ or $-Tsk$ gradient and Hs [$Itotal = (Tes - Tw)/Hs$; $Itissue = (Tes - Tsk)/Hs$]. Hs was smaller in TS condition at both Tw ($p < 0.05$). Itotal was higher in TS condition ($p < 0.05$) following additional insulating layer. Itissue was smaller in TS condition at 29°C. Wearing TS increased Itotal and reduced Hs from the skin. Therefore fall of body temperature and increase of metabolism were modified. It was suggested that TS has the effect of modifying cold stimulus during water immersion.

1-9 Comparison of the Elderly Dietary Life between Nagano Rural Area and Osaka Urban Area

Yuki TSUMURA¹⁾, Tomoe OGINO¹⁾, Naoko HIROTA²⁾ and Yoshiaki SONE¹⁾

1) Department of Human Life Science, Graduate School of

Osaka City University, 2) Department of Human Life Science, Nagano Prefectural College

We compared the dietary life of the elderly who live in Nagano rural area with that of the elderly who live in Osaka urban area from the viewpoints of food consumption pattern and dietary style. There is a significant difference only in consumption of vegetables between them but no difference in other food groups; intake adequacy of vegetables of Nagano residents was better than that of the Osaka residents. In addition, there was a significant difference in dietary style between them; the frequency of dining out, take-out lunch and shopping of food were higher in Osaka urban area. More consumption of vegetable in Nagano is reasonable because of their self-sufficiency of vegetables. The difference in the life style of the elderly in Nagano and Osaka area residents may reflect on the difference in their whole dietary style.

1-10 Physiological Effects of a Mild Thermal Stimulation

Takao ICHIMURA and Shizuko SUEHIRO

Graduate School for Health and Welfare, Yamaguchi Prefectural University

Physiological effects of a mild thermal stimulation were studied by analyzing the electroencepharogram (EEG) and the heart rate variability (HRV) after warming the feet by using a small heating device. %alpha (α) and %delta (δ) were calculated from EEG (Fz, Cz, Pz), while relative activity level of the parasympathetic (cardiac vagal) nerve was estimated from HRV high frequency component. During 5 min of warming and the following 30 min of relaxation, 3 different types of response were observed in the time course of α and δ relative to their individual control level (female 10 subjects, age 21–28); (1) raised α and lowered δ , (2) lowered α and raised δ , and (3) unaltered α and δ . K-complex and sleep spindle were observed in the cases (1) and (2), while high amplitude of delta wave was observed in the case (2). These observations may suggest a healing effect (in (1) and (2)) and/or sleep inducing effect (in (2)) of a mild thermal stimulation by our heating device.

1-11 The Effects of Light Exercise “YURU” on Psychophysiology

Morimasa KATO¹⁾, Hideo TAKAOKA²⁾ and Hideaki SOYA³⁾

1) Foundation for Advancement of International Science, 2) Research Institute of Movement Science, 3) Institute of Health and Sports Sciences, University of Tsukuba

The present study was carried out to investigate the psychophysiological effects of light exercise “YURU”. Three “yuru” trained subjects were participated in this study. All subjects were measured heart rate, blood lactate, cerebral oxygenation, gastric myoelectrical activity and STAI (state-trait anxiety inventory). The subjects were allowed to get accustomed to the apparatus to be used before measurement and the protocol for the testing session. They were tested in following 2 conditions: 1) rest, 17 minutes yuru exercise and