

IB-1-4 Effects of Tactile stimulation with Underwear on Endocrine and Immune Responses in Children

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We found that the tactile stimulation with stiff underwear decreased the autonomic nervous activity evaluated by LF/ HF in the heart rate variability and the change of tympanic membrane temperature during acute cold exposure in young female students. In this study, we measured adrenaline, noradrenalin, cortisol in urine and secretory immunoglobulin A in saliva (s-IgA) with stiff or soft underwear in 14 children, because the autonomic nervous system is closely related with endocrine and immune system to maintain Homeostasis. They wore each underwear 2days at intervals of a week. The subjects with stiff underwear showed significantly higher cortisol and lower s-IgA compared with soft underwear. It suggests that stiff tactile stimulation with underwear may lead physiological responses to a distress condition.

IB-2-1 The effect of the air velocity on thermal comfort after exercise

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The present study has been aimed at examining the effect of the air velocity to different parts of body, by exposing the subject's whole body and face to the air velocity after exercise. Each of twelve female subjects took a 15 minutes exercise and they were exposed to the air velocity in the following, three ways: a) air velocity to the whole body b) strong air velocity to the face and c) soft air velocity to the face. We noticed that the skin temperature of a certain part of the body remained lower for a longer time when only the face was exposed to the air velocity than during the exposure to the whole body. The subject's thermal comfort at the part directly exposed to the air velocity turned to change from "cool", during the exposure, to "warm" when the air velocity is stopped. However she feels from "warm" to "cool" at the indirectly exposed part under the same condition. The change of the thermal comfort showed certain co-relation with that of skin temperature. And it was made clear that the cooling effect of the air velocity differed significantly according to the part of the body exposed to the air velocity.

IB-2-2 Physiological responses of the balneotherapy using dead sea water, artificial sea water and fresh water in women

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This study was to clarify the physiological responses of the Balneotherapy, one of main methods of Thalassotherapy, using different waters. The subjects were nine adult healthy females. Subject A (62 yrs) and B (42 yrs) were participated in the dead sea water experiment for 12 months from 1/13/1997 to 12/19/1997. Other subjects were participated in both of the dead sea and fresh water experiments for three month.

1. The results obtained from the dead sea water Balneotherapy for three months were as follows;

(1) Body weight and girths were remarkably and significantly decreased in the dead sea Balneotherapy. In contrast, the decreases of these values were the least amount in the fresh water Balneotherapy.

(2) The dead sea water showed the considerable effect of keeping the skin wet, but the artificial and fresh water did not.

(3) Judging from bone age, restoration of youth was found in subjects with menstruation in the dead sea Balneotherapy. Although subjects without menstruation showed bone aging in the fresh water Balneotherapy, their bone age did not change in the artificial and the dead sea water Balneotherapy.

2. The results obtained from the repeated dead sea water for twelve months were as follows;

(1) The body weight of subject A decreased by 2.44kg and that of subject B increased by 0.66kg in a year.

(2) The two or three times effect of keeping wet was found in subject A, but there is no change in this effect in subject B.

(3) There was no change in the bone age of subject A, but subject B showed two years' restoration of bone age.

This experiment was done with cooperation of Sekisui Chemical Co., Ltd.

IB-2-3 Seasonal Effect on Peripheral Resistance, Cardiovascular Responses, Pain, and Thermal Sensation to Local Cooling

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To examine the seasonal effect on peripheral resistance and physiological and subjective thermal loads due to local cold stress, the cold-induced vasodilatation (CIVD), cold-pressor response, pain sensation, and thermal sensation induced by finger cooling were measured in both summer and winter. After a 40-min exposure to a warm room temperature condition of 30°C, each of ten young adult males aged between 21 and 30 immersed the left middle finger in 5°C cold water for 10 minutes. The time of onset and magnitude of CIVD showed no significant differences between summer and winter. The finger skin temperature before immersion (BST) also exhibited no significant seasonal differences, showing high average values of around 35°C in both seasons. Before CIVD occurred, maximal increases in systolic and diastolic blood pressure and heart rate tended to occur concurrent with the maximal severity of cold and pain sensations. These cardiovascular and subjective thermal loads also exhibited no significant seasonal differences. These results suggest that sufficient exposure to warm and comfortable conditions before finger cooling could result in higher finger skin temperature levels of around 35°C, and that such pre-immersion conditions could diminish the seasonal effects on peripheral resistance (CIVD) and on cardiovascular and subjective thermal loads to an acute local cold stress.

IB-2-4 A study on suitable clothing for school children under different seasons

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In order to investigate the amount of clothing that is necessary for elementary school children to achieve thermal comfort under various environmental conditions, the clothing worn daily by children in each of the four seasons was examined. The thermophysiological responses of 11 elementary school children (6 male and 5 female) were examined, after which the amount of clothing necessary to achieve thermal comfort for each season/climatic condition was investigated. The dressing habits of the children surveyed, the estimations for suitable clothing based on thermophysiological responses and those calculated by using SET* and PMV equations were compared. The results revealed a wide difference, the reasons for which warrant future investigation.

IB-3-1 The effect on the cold adaptation for

cold storage workers.

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The purpose of this study was to compare the physical and psychological response to cold exposure between subjects working in cold storage workers and healthy adults. Subjects were 18 males (9 cold storage workers and 9 healthy adults) from 22 to 36 years old. After resting in climate chamber (air temperature 25°C, relative humidity 50%) for ten minutes, the subjects repeated three times of the movement from climate chamber (air temperature -25°C, twenty minutes) to another climate chamber (air temperature 10°C, twenty minutes). Following results were obtained. Rectal temperature at the end of experiment were significantly higher for cold storage workers than healthy adults (0.37°C vs 0.51°C). Comfort sensation was more comfortable in cold storage workers. However, there were no significant difference of heart rate and blood pressure. In conclusion, the subjects working in the cold storage have a tendency to adaptation to cold exposure.