Kyushu University

There are a number of fatalities due to physical strain while bathing especially in Japan. Nurses assume a part of the responsibility for prevention of accidents while bathing, and should seize every opportunity to educate patients as to how to bathe safely in their home. To raise the quality of the instruction, it is necessary to assemble data on the effect of bathing on physiological responses. Recently, many such data have been gathered and presented and manipulating the data makes it possible to offer a concrete method of safe bathing regarding for example water temperature, air temperature in dressing room and bathroom, bathroom heating methods etc. On the other hand, there are few reports that focus on comfort while bathing. If a bathing method is not comfortable despite being safe, nobody will wish to employ it. It is important to present information on ways to bath comfortably in order to instruct more effectively. Assessment of comfort while bathing will be an issue in the future.

1-1 Comparative Study of Susceptibility to the Heat and the Cold on Themoregulatory Responses in Japanese Female Adults

Kayoko NOJIRI[1)], Yoko SATO[1)], Mari YOKOI[1)], Kazuhiko YAMASAKI[1)], Keita ISHIBASHI[2)], Shigekazu HIGUCHI[3)] and Takafumi MAEDA[4)]

1) Jissen Women's University, 2) Kyushu University, 3) Akita University, 4) Fukushima Medical University School of Medicine

The subjects were 12 healthy young Japanese adult women. They put on shorts, T-shirts and short pants. Exposure periods were evening (E) and morning (M) during follicular phase (F) and luteal phase (L). The climatic chamber was controlled at 24°C RH50%, the temperature increased to 29°C over 60 minutes gradually. The subjects kept the sitting position. Measurement items were rectal temperature (Tr), skin temperature and subjective sensations. We determined atugari (susceptibility to the heat) and samugari (susceptibility to the cold) according to the subjective sensations during exposure.

The main results were as follows.

1) The order of values of Tr and mean skin temperature was L·E>F·E>L·M>F·M.

2) The theromoregulatry responses were more influenced by circadian rhythm than menstrual cycle.

3) The order of skin temperature of hand and foot was L·E>F·E>L·M>F·M.

4) Atugari had a tendency to feel warm in the peripheral area and to feel cool in the body stem area than samugari.

1-2 Real State of Heat Adaptability in Daily Life, Part 4 Case of Subject A

Yasuto NAKAMURA, Takami OKAMOTO and Yuka YASUNAMI

Department of Environmental and Symbiotic Sciences, Prefectural University of Kumamoto

Real state of heat adaptability in daily life was examined by five younger male subjects with 0.34 clo garments using a climatic chamber in summer. The heat stress in every experiment was set 30 minutes interval response in a room of 30 degree centigrade and 50% relative humidity after transferring from a standard condition room of 25 degree and 50% relative humidity. The experimental duration was 5 months from June till October. Measurement items were perspiration rate on a back, inner ear temperature as core temperature, mean skin surface temperature by 7 points. In this paper a case of subject A was discussed. Heat adaptation term was separated into five duration from June to October; ordinary adaptation term, intermittent heat ascending adaptation term, continuous heat adaptation term, intermittent heat descending adaptation term, and ordinary adaptation term. The tendency was common for five subjects, though the durations were different among them. Subjective vote showed comfortable state in the continuous heat adaptation term and the intermittent heat descending adaptation term.

1-3 Enhancement of Cold-induced Vasodilatation Responses During and Following Physical Exercise in Moderate Cold Environments

Shin-ichi SAWADA, Tatsuo OKA and Hideki FUKUDA

National Institute of Industrial Health, Japan

To investigate whether physical exercise improves cold defense responses caused by finger cooling, CIVD and subjective pain and thermal sensations were observed both after and during light and moderate exercises in a moderate cold environment. Sixteen healthy young subjects immersed their fingers into stirred cold water of 10°C for 10 minutes at an ambient temperature of 10°C. Ten of them exercised for 10 minutes on a bicycle ergometer at 40 and 80 W immediately before the cold water immersion (Experiment I). Six of them exercised at the same level as Experiment I during the immersion (Experiment II).

In the experiment I, marked CIVD response occurred even at an ambient temperature of 10°C whereas little CIVD was observed without the exercise before the immersion. The CIVD response was significantly greater in the exercise of 80 W. Subjective thermal strain was less with the exercise than without the exercise. Also in the experiment II, CIVD reactivity increased in proportion to the increase in exercise level and subjective strain was mitigated.

This study clearly shows that moderate exercise before and during finger cooling improves CIVD reactivity in a moderate cold environment and that cold-induced pain and cold sensation is mitigated.

1-4 Rheological Change in Venous Blood on Lower Leg during Prolonged Sitting in Low Humidity and Hypobaric Environment

Kazuaki YAMASHITA[1)], Katsuki YAMAGUCHI[2)], Tsuneyuki YAMAMOTO[1)], Shuntaro SHIRABE[1)], Nobuko HASHIGUCHI[1)], Masahide KAJI[3)] and Yutaka TOCHIHARA[1)]