Session 7 (Poster Session 2)  
9/14 (Wed) 10:30 - 12:00

P-701  Effects of Temperature on Physiological and Psychological Responses during Night Sleep in Summer  
Ritsuko MIYAHARA1, Hiroko KUBO2  
1) Graduate Faculty of Human Life and Culture, Nara Women’s University 2) Nara Women’s University  
Kita-uoya, Nishi-nachi, Nara City 630-8506, Japan  Email: miyahara2407@mary.ne.jp

ABSTRACT

The present study examined physiological and psychological responses to changes in the thermal environment during night sleep in summer. Seven healthy female college students participated in a sleep experiment. Initially, sleep environment air temperatures were established at a preferred temperature for each subject, based on preferred daytime air temperatures determined in a climate chamber. The range of preferred temperature was 24°C to 28°C. During sleep, the following six conditions were applied. 1. Constant-mode: subject’s preferred temperature was maintained during sleep. 2. Timer-mode (1.5 h): temperature was reduced 2°C from subject’s preferred temperature for 1.5 hours, increased by 4°C for 1 hour, then maintained for 4.5 hours. 3. Timer-mode (3 h): temperature was reduced 2°C from subject’s preferred temperature for 3 hours, increased 4°C for 1 hour, then maintained for 3 hours. 4. Up-mode: temperature was increased 4°C from a temperature 2°C lower than subject’s preferred temperature for 7 hours. 5. Down-mode: temperature was decreased 4°C from a temperature 2°C higher than subject’s preferred temperature for 7 hours. 6. Sleep-mode: temperature was decreased 1.5°C from subject’s preferred temperature for 1 hour, then increased 2.5°C for 6 hours.

Measurements included EEG rectal temperature (Tre), skin temperature (Tsk), heart rate, and responses to the OSA sleep inventory. Changes in room temperature affected Tsk and Tre during sleep. In the Down-mode, Tsk decreased 1°C and Tre decreased 0.5°C after 7 hours. These Tsk and Tre changes were greater than changes observed in the other conditions. Heart rate gradually increased in both the Timer-mode and Up-mode, but decreased in the Down-mode. Although no significant differences were observed in sleep efficiency among all conditions, in the Timer-mode (1.5 h), the percentage of stage 3-4 sleep (SWS) was significantly reduced in the 2nd segment during which the room temperature was changed.

Key words: change of room temperature; sleep stage; skin temperature; rectal temperature; heart rate

P-702  Effect of Low Relative Humidity on Physiological and Subjective Responses- A Comparison between Old and Young People -  
Yujin SUNWOO1, Chinmei CHOU1, Junko TAKESHITA1, Motoko MURAKAMI2 and Yutaka TOCHIHARA3  
1) Kyushu Institute of Design 2) Kaneo Cosmetics Inc. 3) Kyushu University  
4-9-1 Shiobaru, Minamiku, Fukuoka, JAPAN 815-8540 E-mail: sunwooyujin@yahoo.co.jp

ABSTRACT

The purpose of this study was to investigate the effect of low relative humidity on physiological and subjective responses. In order to investigate the influence of low relative humidity, we measured saccharin clearance time (SCT), frequency of blinking, heart rate, blood pressure, hydration state, transdermal water loss (TEWL), recovery sebum and skin temperature as physiological responses. Also, we asked subjects to evaluate thermal, dryness and comfort sensations as subjective responses using a rating scale. As the subjects of the experiment, eight non-smoking healthy male students (21.7±0.8 yr) and eight non-smoking healthy elderly men (71.1±4.1 yr) were selected. The pre-room was controlled with an air temperature (Ta) of 25°C and relative humidity of 50%. The test-room was adjusted with a Ta of 25°C and relative humidity of 10%, 30% and 50%, respectively. SCT of the older age group under the thermal conditions with a Ta of 25°C and relative humidity of 10% was significantly longer than that of the younger age group. And frequency of blinking in both older and younger age groups was significantly increased under the thermal conditions with a Ta of 25°C and relative humidity of 10% and 30%, respectively. But there was no significant difference between the older and younger age groups. Also, there was no significant difference between the two groups in hydration state. TEWL and comfort sensation. The younger age group was significantly more sensitive to dryness and thermal sensation than the older age group.

Key words: saccharin clearance time (SCT), frequency of blinking, subjective response, old people