Fluctuation of acceleration at knee joint level by ankle joint limitation in normal subjects. B-24

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The purpose of this study was investigated the fluctu-ation of acceleration at knee joint level by ankle joint limitation using short leg brace (S.L.B.). Nine normal subjects were measured in following 5 con-ditions: bare foot control(BF1), S.L.B. with -5 degree limitation(SF5), S.L.B. with -10 degree limitation(SF10), shoe(S-F), and bare foot after control(BF2). Y axis acceleration, Z axis acceleration, and fluctua-tion of knee joint angle were examined. All data were normalized by the control values. Depending upon the increment of planter-flexion lim-itation:

itation;

1) Both the maximum extension in mid-stance and maximum flexion from heel strike to mid-stance of knee joint were increased.

The maximum value of Y axis acceleration was increased.
 The maximum value of Z axis acceleration was decreased.

Moments of force and mechanical power of lower limb B-25 at the landing.

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The purpose of this study is to report the patterns of moments of force at the ankle, knee, and hip for a group of male younger subjects and to analyze the patterns of mechanical power generation and absorption at each of the joints.

The authors filmed five subjects from posterior and lateral views with high speed camera(200 frames/sec). For each frame the positions of landmarks based on Bobbert are determined with a motion-analyzer. When the test subjects perform a landing motion from the height of 60cm, the main external forces acting on the lower limbs are measured with force platform which allow the quantification of the ground reaction force. Assuming that the resultant moment about each of joints is caused by the force transmitted via the ankle, this force is given by the quotient of the resultant moment about one joint. The total moment of force pattern of the lower limb was primarily

extensor during the landing motion, and the average peak of power generation was seen the similar pattern at the ankle. Power patterns showed the knee to have five normalized phases, especially an initial shock absorbing peak was the first half of landing until maximal knee flexion.

C-01 Effect to sleep by using air conditioner in summer time.

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Faculty of Home Economics, Jissen Women's University This summer report examined the effect of long time cooling by air conditioner in sleep on some physiological and psychological reactions and bed climate. Three female students were tested in nocturnal sleep as following condition, (1)26°C65%RH(cooler condition),(2)30°C \rightarrow 28°C \rightarrow 29°C65%RH(standard condition). And four female students were tested in daytime nap as following codition,(1)26°C65%RH(cooler condition)(2)30°C65%RH (stndard condition). Skin temperature, rectal temperature, heart rate, bed climate, body movement, sleep onset latency were measured. The subjects were asked to vote thermal sensation, comfort sensation, and refreshness in the morning. The results were as follows:

1)In nocturnal sleep, decrease of the rectal temperature was larger in cooler condition.
2)In nocturnal sleep, body movement increased in cooler condition, on the other hand hand and foot movement increased in standerd condition.

- 3)In day time nap, subjective sensation was more comfortable in cooler condition.
- 4)In daytime nap, heart rate was significantly lower in cooler condition.

Variation of Body Temperature and Bed Climate before and C-02 after Parturition

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In order to investigate changes of body temperature and bed climate before, during and after delivery, 10 female volunteers, aged 23 to 38 years old, were studied. At the end of the first stage of delivery, relative humidity in the bed was seen to have risen to above 70%. However, it decreased to below 40% during the 6 hours after parturition, while both rectal and skin temperature increased gradually up to 37.7°C. The subjects reported feeling cold and uncomfortable immediately after delivery, but felt comfortable 2 hours after the third stage of delivery. These changes observed in subjective sensation were closely related to the body and skin temperature. These results suggested that it is the time to produce body temperature toward the lost of energy during delivery, in the early part of confinement.

The Effects of a New Air Mattress upon Human Sleep (1): C-03 Body Movements

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The purpose of this study was to investigate the effect of a new type of air mattress upon human sleep. This air mattress, which employs a pump timer to increase/decrease the inflation pressure in order to help avoid decubitus, was tested. Six healthy female volunteers, aged 19 to 23, served as the subjects. The experiment was carried out under three conditions: using regular futon (F), the (Airmat(+)), and air mattress with the pump timer turned off (Airmat(-)). Subjects' sleep was monitored using a TV monitor throughout the night. Rotating move and/or simultaneous movement of the waist, leg and arm were categorized as gross movement, and localized movement on leg or arm, as small movement. The gross movement was used as the marker for well sleep. Gross movement was found to be reduced under Airmat(+) and Airmat(-) conditions, compared with the Futon condition. The Airmat(+) condition tended to decrease more both gross and small movements than the Airmat(-) condition. Six subjects reported feeling that the bed and sleep were better in the Airmat(+) condition than in the others. These results suggest that this new airmattress might offer some advantages for sleep quality .

The effects of a New Air Mattress upon Human Sleep (2): C-04 Bed Climate

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The purpose of this study was to investigate the effect of air mattress upon bed climate and body temperature. The experiment was carried out under three conditions: Airmat(+), Airmat(-) and Futon. Room temperature and relative humidity were controlled at 23°C, RH60%.

Following results were obtained: Temperature of the forehead was higher in Airmat(+) (35.7-36.0°C) than in Airmat(-) (35.6-35.9°C). Dorsal hand temperature was also higher in Airmat(+). A significant difference was seen in bed climate of the waist part. Temperature was higher in Futon condition (35-36°C) than in Airmat(+) and Airmat(-) (33-35°C), while relative humidity was higher in Airmat(+) and Airmat(-) condition (45-65%) than in Futon (43-50%). Thermal sensation in the morning was cooler and comfort sensation was better in Airmat (+) and Airmat(-). Although comfort sensation in the morning and sleep estimation were better, relative humidity was higher in Airmat(+) and Airmat(-). Further study on the materials of this new air mattress is needed.