**O-16** Comparison of anaerobic threshold during graded exercise between in the morning and in the afternoon

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**Purpose:** The purpose of the present study was conducted to determine the relationships between the ventilatory volume, double product (DP) and cardiac parasympathetic nervous system modulation during graded exercise in the morning and afternoon. **Methods:** Volunteering to participate in this study were 10 healthy Japanese males, who gave their informed consent prior to participation. Each subjects performed graded exercise consisting of 90 seconds of exercise at pedaling rate of 60 rpm. The intensity of exercise was started at 10 watts and was increased 10 watts at every step of the graded exercise. Both experimental tests were performed in the morning (9-10 a.m.) and the afternoon (4-6 p.m.). HR, BP, ventilatory volume and cardiac autonomic nervous system activity were measured at each exercise step. The VT, DPBP and HFBP were calculated by the equation to define the relationship between exercise workload and each parameter. The VT, DPBP and HFBP were used as index of anaerobic threshold (AT). **Results and Discussion:** The VT, DPBP and HFBP in the morning were significantly lower than in the afternoon. These data suggested the possibility that an AT index showed a change in days. At intensity of DPBP, HR, SBP and DP in the morning were significantly lower. During graded exercise in the morning, the anaerobic metabolism was provided at HR, SBP and DP are low values. In conclusion, the AT in the morning was reached at a lower exercise intensity than exercise in the afternoon.

**Key words:** circadian rhythms, AT, graded exercise

**O-17** Effects of dietary modification and habitual exercise on weight loss, abdominal girth and vital age

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**Introduction:** We have been conducting diet and/or exercise interventions for weight loss of obese persons since 1983, and nowadays can make an estimate of -8 kg, -8 cm, and -8 yr on the average in weight, abdominal girth, and vital age, respectively, at the beginning of the intervention. At this conference, we report a summary of intervention effects obtained by diet only (DO), exercise only (EO), and diet plus exercise (DE) interventions.

**Methods:** Participants were 228 obese, middle-aged men (50.3 ± 9.8 yr). Groups DO and DE participated in weekly dietary sessions (1680 kcal/d) and groups EO and DE engaged in 90-min structured exercise sessions on 3 times/week. Weight, abdominal girth and vital age were measured and estimated at before and after interventions.

**Results:** The average reductions of weight were -8.5 kg, -6.9 kg, and -2.5 kg for groups DE, D, and E, respectively; and those of abdominal girth were -11.2 cm, -7.7 cm, and -3.5 cm, respectively. The effects on vital age were -11.7 yr, -6.3 yr, and -7.1 yr, respectively. Among various components of vital age equation, physical fitness improved in all the groups. Blood pressures decreased most in group DE. It is concluded that a combined intervention of proper diet and well-balanced exercise has the greatest effects on almost all health- and fitness-related variables.