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Apelin Secretion In Overweight/obese Adults Following A Single Bout Of Exhaustive Exercise

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(No relevant relationships reported)

Obesity and associated metabolic dysfunction has reaching epidemic levels. Physical activity is beneficial for preventing metabolic symptoms, of which myocytes secreted during exercise play a major role. In this study, the circulatory level of apelin, one of the myokines, was assessed in patients with obesity and metabolic diseases.

PURPOSE: To examine the effects of body composition, metabolic parameters, and physical fitness on apelin secretion following a single bout of exhaustive exercise.

METHODS: A total 60 subjects [34 women (21 lean and 13 overweight/obese) and 26 men (8 lean and 18 overweight/obese)], age 30-59 years, with body mass index (BMI) of 18-30 kg/m² were recruited based on the guidelines for overweight (BMI of 23-24.9 kg/m²) and obesity (BMI of over 25 kg/m²) in Korean. Body composition, clinical parameters, and physical fitness test were conducted. During an acute treadmill exercise following Bruce protocol, the blood before and 0, 15, 30 min after exercise were collected for analyses of apelin, lactate, lactate dehydrogenase (LDH), and creatine kinase (CK). Relationships among exercise-induced apelin, metabolic factors, and physical capacity were then analyzed. All measurements were conducted using independent, paired *t*-test between groups/time points, and *Pearson* correlations.

RESULTS: There are significant positive correlations in post-exercise apelin level and skeletal muscle mass ($r = 0.350, P = 0.006$), homeostatic model assessment of insulin resistance (HOMA-IR; $r = 0.366, P = 0.004$), HOMA insulin secretion (HOMA-%B; $r = 0.360, P = 0.005$), and isokinetic flexion and extension tests in 60° and 240°/sec (all variables, $P < 0.05$), but these parameters were not correlated with pre-exercise apelin levels. In men, the area under the curve of plasma apelin level was significantly higher in obese than lean individuals ($P < 0.05$), but this difference was not observed in women.

CONCLUSIONS: A single bout of exhaustive exercise induced apelin secretion, which not only correlated with muscle mass, and insulin resistance and secretion, but also associated with upper and lower limbs' physical capacity. Our data suggest that apelin may be a therapeutic target to overcome metabolic dysfunction in obese patients.

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High Intensity Interval Training is Feasible Outside of a Laboratory Setting in Sedentary, Obese Women

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(No relevant relationships reported)

High intensity interval training (HIIT) is a suitable alternative to endurance exercise (Burgomaster et al. 2008) as it elicits similar adaptations yet is more time efficient and enjoyable (Kong et al., 2016). Results from Sawyer et al. (2016) and Higgins et al. (2016) reported that HIIT is effective in persons with obesity. However, the majority of existing data supporting efficacy of HIIT were acquired in a laboratory in which trained personnel supervise all sessions. This setting may not translate to HIIT performed in a "real world" environment.

PURPOSE: The purpose of this study was to determine the feasibility of HIIT outside of a laboratory setting in sedentary, obese women.

METHODS: 17 sedentary, obese women (age=37.51 ± 10.53 yr.; BMI=39.11±4.34 kg/m²) participated in a 6-week exercise intervention with 3 training sessions per week, 2 in the laboratory (LAB) and 1 at home (HOME). Sessions were held at the same time of day within subjects and were performed a minimum of 24 hr apart. Heart rate (HR) was recorded via telemetry during LAB sessions, which were performed on a cycle ergometer. However, subjects were allowed to select the exercise modality for the HOME sessions, including running, cycling, or elliptical. The instructions for the HOME exercise mimicked the structure of the LAB sessions. Subjects were given downloadable HR monitors (Polar Inc., Lake Success, NY) to record HR during each HOME session. Subjects were asked to complete a HOME session 1 day/week at Rating of Perceived Exertion equal those attained during LAB on the Borg CR-10 scale. There were no consequences if the sessions were not completed.

RESULTS: The average compliance rate for HOME in all 17 subjects was 73.53 ± 30.65%. Peak HR was higher during HOME for Week 1 (174.09 ± 18.63 vs 163.50 ± 14.98 b/min; $p=0.01$), Week 2 (175.56 ± 16.76 vs 157.50 ± 18.54 b/min; $p=0.007$), Week 3 (167.92 ± 20.45 vs 158.83 ± 13.89 b/min; $p=0.014$), and Week 4 (167.22 ± 21.38 vs 155.11 ± 15.77 b/min; $p=0.026$) versus LAB. There were no differences in peak HR between HOME and LAB peak HR for Week 5 (158.67 ± 26.08 vs 157.00 ± 16.30 b/min; $p=0.99$) or Week 6 (154.00 ± 28.82 vs 129.67 ± 31.66 b/min; $p=0.31$).

CONCLUSION: In obese women, compliance to home-based HIIT is relatively high, and selected intensities are higher than those attained during lab sessions.

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Comparison of Measured and Predicted Resting Energy Expenditure Equations in Obese Pre-bariatric Surgery Patients

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(No relevant relationships reported)

PURPOSE: To compare measured resting energy expenditure (MREE) to predicted resting energy expenditure (PREE) determined by three pre-programmed multi-frequency bioelectrical impedance analysis prediction equations in obese pre-bariatric surgery patients.

METHODS: Ninety women and twenty-six men (age: 42.6 ± 11.0 years, BMI: 48.1 ± 9.1 kg/m²) were included in this sample. After 3 hours of seated rest, MREE was measured prior to bioelectrical impedance analysis (SECA-mBCA 514) body composition assessment. MREE was obtained over a 10-minute period using a hand-held indirect calorimetry device (Korr REE-VUE). Three preprogrammed equations in the bioelectrical impedance analyzer (i.e. Mueller 2004, Liu 1995, and FAO/WHO/UHU) were used to calculate PREE.

RESULTS: The mean MREE determined by indirect calorimetry was 2164.1 ± 460.2 kcal. The PREE values (mean ± SD) for the Mueller, FAO/WHO/UHU, and Liu equations were 2182.5 ± 427.8 kcal, 2129.2 ± 521.2 kcal, and 2352.2 ± 473.4 kcal, respectively. Following statistical comparison, no significant differences were observed between MREE and PREE determined by the Mueller (14.6 ± 313.6 kcal, $p = 0.896$) and FAO/WHO/UHU (-38.8 ± 371.8 kcal, $p = 0.102$) equations. However, a significant difference was observed between MREE and PREE by Liu (184.2 ± 333.3 kcal, $p = 0.003$).

CONCLUSIONS: Our findings indicate that the Mueller and FAO/WHO/UHU programmed bioelectrical impedance analysis equations produce similar resting energy expenditure values as indirect calorimetry. These findings are important to weight management clinics without access to indirect calorimetry that currently use or are considering the use of this bioelectrical impedance analysis technology for their patients. Resting energy expenditure can be predicted in obese patients prior to individualized diet and exercise programming.

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Obesity in the Trauma Patient Delays Hospital Discharge and Increases Treatment Cost

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(No relevant relationships reported)

In the United States, more than one third of all adults are obese, classified by a BMI ≥ 30 kg/m². Direct medical costs for these individuals account for approximately 6% of national health expenditure. Several mechanisms have been proposed, but most consistently, obesity has been shown to complicate treatment and inflate resource utilization. Another possible explanation is obesity's role in prolonging recovery. Currently, information regarding the relationship between obesity and the duration of care is limited.

PURPOSE: To examine the effect of obesity on hospital discharge and consequent treatment cost.

METHODS: Our study involved 1,201 patients admitted to a Midwestern hospital who had complete demographic, anthropometric, and treatment data. Independent variables were age, sex, anthropometric indices, and five measurements of injury severity. Dependent variables were hospital length of stay (number of days) and total patient billing (dollars). Independent-

samples t tests assessed differences between obese and non-obese patients, a negative binomial regression evaluated hospital length of stay, and a multiple linear regression tested logged cost data.

RESULTS: Across the sample, average age was 55.1 ± 20.3 and 67.5% of patients were male. Average BMI was 28.4 ± 6.6 and 14.4% of patients were obese. Mean injury severity score was 16.3 ± 10.6 and average length of stay was 7.7 ± 9.0 days. Independent-samples t tests found obese patients to have 19.4% longer hospital stays (1.5 days; $p=0.061$) and 31.4% greater hospital bills ($p=0.015$) than non-obese patients. With confounding variables held constant, the negative binomial regression found obesity to predict a 17.1% longer hospital stay (1.3 days; $p=0.007$). While the multiple linear regression showed a non-significant increase for the effect of BMI on logged patient charges ($p=0.111$), classification of obesity on logged patient charges supported a trend for increase in patient cost ($p=0.078$).

CONCLUSIONS: Obesity in the hospitalized patient associated with a significantly longer duration of care and a trend for increased total expenditure. Exercise may function as a preventive strategy to avert the temporal and financial ramifications of obesity.

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Reducing Attrition and Improving Program Adherence in a Physician-Referred Weight Loss Program for Adults.

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(No relevant relationships reported)

It has been shown that physician-referred hospital-based team-approach programs can be effective interventions for weight loss for adults. Programs that include strategies in behavior change may assist in successfully completing a weight loss program.

PURPOSE: The purpose of this project was to evaluate the effectiveness of behavioral contracting to improve program adherence and reduce attrition in a physician-referred weight loss program for adults.

METHODS: Participants included obese ($BMI \geq 30$) adults (Age 53.4 ± 1.3 yrs) enrolled in a physician-referred program. Participants were enrolled without signing an accountability contract (CONTROL, $N=48$) or enrolled after signing an accountability contract (CONTRACT, $N=48$). Starting and final weights were recorded before and after a 16-24 week intervention period that included supervised exercise sessions (EX), and scheduled consultations with a registered dietitian (RD, $N=4$) and a behavioral health specialist (BHS, $N=4$). The CONTRACT group signed an accountability statement that listed program goals, standards/expectations, and an acknowledgment of commitment statement. Attendance for EX, RD, and BHS sessions was recorded. Program completion was determined if a final weight was recorded for a participant at the end of the program. Independent sample t-tests ($p < 0.05$) were used to determine differences in participant characteristics.

RESULTS: There were no significant differences in participant characteristics for CONTRACT as compared to CONTROL (Age 53.0 ± 13.6 vs. 53.8 ± 12.0 ; Sex 81.3% vs. 81.3% female; Starting Weight (lbs) 238.1 ± 44.7 vs. 228.1 ± 38.9 ; % Weight Loss $-6.7 \pm 3.3\%$ vs. $-4.8 \pm 4.5\%$). Program completion was higher for CONTRACT as compared to CONTROL (87.5% vs. 58.3%). The proportion of participants who attended 75-100% of required consultation visits was higher for CONTRACT as compared to CONTROL (RD 85% vs. 29%; BHS 77% vs. 25%). However, EX attendance was slightly lower for CONTRACT as compared to CONTROL (44% vs. 52%).

CONCLUSION: Behavioral contracting may be an effective tool for increasing specialized consultation adherence and reducing attrition in a physician-referred weight loss program. Additional research is required to determine how to increase exercise session adherence.