minutes, 3 times per week for 12 weeks. At pre- and post-12 wk. respiratory muscle strength; maximum inspiratory pressure (MIP) maximum expiratory pressure (MEP), lung function, dyspnea scores and a 6-minute walk test were assessed.
RESULTS: After 12 weeks, 6 minute walk distance and FEV1 significantly increased ($p<0.05$) in the DBE (7.71% and 18.75%, respectively) and PBE (10.78% and 20.87%, respectively) groups compared to control. Dyspnea scores were significantly decreased ($p<0.05$) in both the DBE (51.51%) and PBE (48.89%) groups compared to control. However, the PBE group had significantly increased ($p<0.05$) MIP (37%) and MEP (23%) compared to the DBE (3.42% and 4.13%, respectively) and CON (0.87% and 1.46%, respectively) groups.
CONCLUSION: Our findings demonstrate that while both diaphragmatic and pursed-lips breathing exercise using a windmill toy improve cardiovascular fitness, lung function and reduce dyspnea to the same degree, pursed-lip breathing exercise using a windmill toy exerts more favorable effects than diaphragmatic breathing exercise for increasing respiratory muscle strength in the elderly.
Keywords : diaphragmatic breathing exercise, pursed-lips breathing exercise, respiratory muscle strength, lung function, dyspnea
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453 Board #290 June 1, 9:30 AM - 11:00 AM

Dietary Astaxanthin Supplementation Improves Walking Performance And Blood Lactate Level After Walking Test In Community-dwelling Elderly Subjects

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PURPOSE: Chronic fatigue is prevalent in elderly subjects. Recent studies demonstrated that astaxanthin supplementation improved aerobic performance for exercise in animals. In addition, we also reported that astaxanthin attenuated capillary regression of atrophied muscle in animals. Due to the current lack of clarity, we examined whether three month of dietary astaxanthin supplementation can influence walking performance and blood lactate level after walking in community-dwelling elderly individuals.
METHODS: Twenty-nine community-dwelling healthy volunteer subjects (80.9 ± 1.5 y.o.) were enrolled in this study, and were randomly assigned into two groups: one received placebo capsules (placebo group, n = 13), while the other received astaxanthin capsules (astaxanthin group, n = 16). The subjects ingested either astaxanthin (every 12 mg, 2 times/day) or placebo (every 12 mg, 2 times/day of vitamin E) capsules every day for the three-month study period. Subjects performed 6-min walking distance (6MWD), the measurements of derivatives of reactive oxygen metabolites (D-ROM) and blood lactate prior to and post treatment. Written informed consent was obtained from the subjects after being fully informed regarding the details and methods of this study.
RESULTS: Astaxanthin supplementation resulted in a decrease of the D-ROM value ($P < 0.01$) but not placebo. There was a treatment effect on 6MWD in astaxanthin group compared with placebo group ($P < 0.05$). The distance and step number during 6-min walking test in astaxanthin group were higher than those in placebo group. Furthermore, the rate of increase in blood lactate after walking was lower in astaxanthin group ($P < 0.01$) than in placebo group.
CONCLUSIONS: These data suggest that astaxanthin supplementation may be an effective treatment to counter the declined physical performance and detrimental effects of aging.
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Effects Of Fall-prevention Program On Functional Fitness For Community-dwelling Japanese Elderly With Knee Pain

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PURPOSE: To examine effectiveness of three-stages fall-prevention program on balance ability and ADL-related functional fitness for community-dwelling Japanese old-old women with knee pain.
METHODS: After giving written informed consent, the subjects, unable to stand on one leg more than 20 seconds with eyes open, were divided into the 3 times/week group (HFG; 15 females, 81.6±2.7 yrs, BMI 22.6±1.6) and the 1times/week group (LFG; 14 females, 81.8±1.2 yrs, BMI 21.4±1.4). The program was composed of three stages for 16 weeks. First, they learned about managing skill for their physical soreness and were asked to standing on one-leg with eyes open for one minutes, 3 times a day both each leg at class and at home. Second, they learned to strengthen their core and lower legs muscle using a swiss ball and elastic band. The last stage was to learn 3 minutes arm-and legs combined chair-exercise program with music. ADL-related functional fitness(sitting & standing time, zigzag walking time), one-leg standing time with eyes open, knee extension strength, fear of falling score, and pain score (modified-WOMAC) were obtained. Balance ability was measured by the area covering and total length of the center of gravity sway(COP). Each measurement items were assessed before and after the intervention period. Student's T-test and two-way repeated measures ANOVA were used to test the effectiveness.
RESULTS: The class participation were 82.7±1.5% and 81.0±2.7% respectively. Sitting & standing time (HFG: 17.4±1.7 to 16.3± 1.6 sec., LFG: 17.4±1.2 to 11.8±6.5sec. P=0.031), zigzag walking time(HFG: 19.6±1.8 to 17.0±0.9sec., LFG: 17.4±1.2 to 17.4±1.1sec, P=0.465), one-leg standing time with eyes open(HFG: 5.8±0.9 to 12.4±0.4 sec., LFG: 5.4±0.9 to 6.1±0.6sec, P=0.000), knee extension strength(HFG: 192.0±4.9 to 208.5±11.5 N, LFG: 192.0±15.5 to 196.5±4.6 N, P=0.012), and balance ability(area covering of COP; HFG: 15.3±1.6 to 10.6±2.0 cm2., LFG: 14.6±1.3 to 16.7±3.0 cm2, P=0.043, total length of COP; HFG: 130.6±8.2 to 100.7±7.6 cm., LFG: 134.0±11.8 to 135.7±11.8 cm, P=0.033),knee pain score also improved significantly in HFG. Fear of falling score was not change in both groups.
CONCLUSIONS: Three-stage fall-prevention program was effective on balance ability and functional fitness for Japanese old-old females with knee pain.

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455 Board #292 June 1, 9:30 AM - 11:00 AM

Can Walking Pace Predict The Risks Of Cognitive Decline And Dementia In Elderly Population?

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The estimated numbers of dementia patients may increase to 115 million by 2050 in worldwide, thus early detection of the development of cognitive decline and dementia would potentially be of substantial benefits to the patients, families and society. Although some evidence from qualitative systematic review has indicated an inverse association between walking pace and cognitive dysfunction, the magnitude of the association has not been systematically investigated and remains unclear.
PURPOSE: To quantitatively assess the association of walking pace with the risk of cognitive decline and dementia among elderly population through a meta-analysis of prospective cohort studies.
METHODS: The relevant prospective cohort studies were identified by searching the PubMed and Embase database through October 2015. The association between walking pace and the risks of cognitive decline and dementia was expressed as weighted RR as comparing the lowest to the highest level of walking pace, and dose-response relation. Random-effects model was used in all analyses.