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THE IMPACT OF WEIGHT WAIST BELT ON THE EFFECTS OF INTERVAL WALKING TRAINING IN WATER IN MIDDLE-AGED AND OLDER WOMEN WITH OVERWEIGHT

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We have reported that the respiratory gas exchange threshold (GET) increased during graded walking in water compared with that on land, increasing fast walking intensity during interval walking training (IWT) in water, resulting in increasing aerobic capacity more than on land after 8-week IWT (Eur. J. Appl. Physiol. 2016). On the other hand, in a preliminary study, we found that the increase in the GET in water was attenuated in subjects with overweight. This might be caused by increased buoyancy with reduced relative body density due to increased body fat. In the present study, we examined in middle-aged and older women with overweight whether the GET increased during walking in water when they wore weight belt, and whether IWT with wearing the belt for 8 weeks increased aerobic capacity more than that without wearing the belt due to increased exercise intensity of fast walking during IWT.

We divided 36 middle-aged and older women (~66 yr and ~35% %body fat) randomly and equally into two IWT groups; wearing weight belt on the waist (WBT) and not wearing the belt (CNT). In WBT, body weight in water was adjusted to ~30% of that on land while in CNT, it remained at ~20%. We instructed subjects in both groups to perform IWT to repeat ≥ 5 sets of alternative fast and slow walking for 3 min each per day, >4 days/ week, and for 8 weeks. The target exercise intensity for fast walking was $\geq 35\%$ higher than GET and that for slow walking was $\leq 40\%$ lower than GET, which were determined by graded walking test in each condition prior to starting training. During training, we measured exercise intensity with calorimeter (JD-Mate, Kissei Comtec) installed on the back of the head. In addition, before and after training, we measured peak aerobic capacity (VO_{2peak}) and GET on land by graded cycling test.

Before training, wearing weight belt increased GET in water by 17% compared with not wearing the belt ($P < 0.01$). During IWT, fast walking intensity in WBT was 31% ($P = 0.01$) higher than in CNT. After training, VO_{2peak} and GET by graded cycling test increased by 106% and 166%, respectively (both, $P < 0.05$).

Thus, IWT in water with wearing weight belt might be effective to increase aerobic capacity for middle-aged and older women with overweight.

Key words: interval walking training in water, %fat, buoyancy, weight belt, training effects