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PLASMA EXPANSION BY HOME-BASED WALKING TRAINING AND THE ENHANCED EFFECTS OF CARBOHYDRATE AND WHEY-PROTEIN SUPPLEMENTATION IN OLDER PEOPLE

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An increase in plasma volume (PV) with increased plasma albumin content (Alb_{cont}) by cycling exercise training reportedly improves thermoregulatory responses during exercise in older people; however, it remains unknown whether home-based walking training have the same effects. We examined whether interval walking training (IWT) increased PV with increased Alb_{cont}, and whether a mixture of carbohydrate + whey protein intake during IWT enhanced the effects.

Seventeen male and 10 female older subjects (~77 yr), who had IWT for ≥ 24 months before participating in this study, were used as subjects. They were divided into two groups; CHO, consuming carbohydrate (22.5g) alone and Pro-CHO, consuming a mixture of carbohydrate (15 g) and whey protein (10 g), within 30 min after exercise respectively, during IWT for 5 months, repeating a set of fast walking at $> 70\%$ $\dot{V}O_{2peak}$ and slow walking at $\sim 40\%$ $\dot{V}O_{2peak}$ for 3 min each, > 5 sets/day, and > 4 days/ week. Before and after the training, we measured PV and Alb_{cont}.

We found that PV and Alb_{cont} before starting the training were significantly correlated with training days for 12 months before starting IWT in this study ($r=0.716$, $P<0.001$ and $r =0.671$, $P<0.001$, respectively) and that after the training, PV and Alb_{cont} tended to decrease in CHO ($P=0.081$ and $P=0.130$, respectively) while remained unchanged in Pro-CHO (both, $P>0.74$) with significant differences in the changes from the baselines between groups ($P=0.020$ and $P=0.041$, respectively).

Thus, IWT increased PV and Alb_{cont} with training days and a mixture of CHO + whey protein intake during IWT enhanced the effects.

Key words: plasma expansion, interval walking training, carbohydrate and whey protein supplement, long-term effect,