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EFFECTS OF 5-AMINOLEVULINIC ACID WITH IRON SUPPLEMENTATION ON RESPIRATORY RESPONSE TO EXERCISE AND INTERVAL WALKING TRAINING ACHIEVEMENT IN MIDDLE-AGED DEPRESSIVE WOMEN

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Although interval walking training (IWT) has been suggested to improve depressive symptoms, not only psychological but also physical barrier may hinder the patients from accustoming themselves to the training. We examined whether 5-aminolevulinic acid (ALA) with sodium ferrous citrate (SFC) lowered the barriers and improved depressive symptoms.

We used 9 sedentary female outpatients [53±8(SD) yr] as subjects who showed major depressive disorder (MDD) according to Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria. The study was conducted in a placebo-controlled, randomized double-blind crossover design. All subjects underwent two trials for 7 days each in which they performed IWT with ALA + SFC or placebo supplement intake (CNT), intermittently with a 10-day washout period. For the first 6 days of each trial, exercise intensity for IWT was measured by accelerometry. Before and after each trial, subjects underwent a graded cycling test, and lactate concentration in plasma ($[\text{Lac}^-]_p$), oxygen consumption rate (VO_2), and carbon dioxide production rate (VCO_2) were measured. Furthermore, depression severity was assessed by Montgomery-Åsberg Depression Rating Scale (MADRS) on the same days.

We found that increases in $[\text{Lac}^-]_p$, VO_2 , and VCO_2 during graded cycling were attenuated in the ALA + SFC trial ([before vs after] x workload; all, $P < 0.01$) while none of these in the CNT trial ($P > 0.27$). The training days, impulse, and time at fast walking were 33% ($P = 0.035$), 46% ($P = 0.014$), and 46% ($P = 0.009$) higher during the ALA + SFC than the CNT trial, respectively. Furthermore, MADRS score was decreased only in the ALA + SFC trial ($P = 0.001$).

Thus, ALA + SFC supplementation reduced physical barrier to exercise, increased IWT achievement, and thereby improved the symptoms in middle-aged depressive women.

Key words: 5-aminolevulinic acid, interval walking, depression