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Repeated waon therapy improves pulmonary hypertension during exercise in patients with severe chronic obstructive pulmonary disease

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Abstract

Objectives: Repeated Waon therapy, which uses a far infrared-ray dry sauna system, improved the vascular endothelial function and the cardiac function in patients with chronic heart failure. In patients with chronic obstructive pulmonary disease (COPD), pulmonary hypertension (PH) is associated with a poor prognosis. We investigated whether repeated Waon therapy improves PH, cardiac function, exercise tolerance, and the quality of life (QOL) in patients with COPD.

Methods: Consecutive 13 patients with COPD, who met the Global Initiative for Chronic Obstructive Lung Disease criteria and had breathlessness despite receiving conventional treatments, were recruited for this study. They underwent Waon therapy at 60 degrees C in sauna for 15 min following 30 min warmth with blankets outside of the sauna room. This therapy was performed once a day, for 4 weeks. Cardiac function, exercise tolerance, and St. George's Respiratory Questionnaire (SGRQ) were assessed before and 4 weeks after Waon therapy.

Results: Right ventricular positive dP/dt at rest elevated significantly from 397 +/- 266 to 512 +/- 320 mmHg/s ($p = 0.024$) after the therapy. While the PH at rest did not significantly decrease, the PH during exercise decreased significantly from 64 +/- 18 to 51 +/- 13 mmHg ($p = 0.028$) after Waon therapy. Furthermore, the therapy prolonged the mean exercise time of the constant load of cycle ergometer exercise test from 360 +/- 107 to 392 +/- 97 s ($p = 0.032$). The total scores of SGRQ improved from 59.7 +/- 16.9 to 55.3 +/- 17.2 ($p = 0.002$). In addition, no adverse effects were observed related to Waon therapy.

Conclusions: Repeated Waon therapy improved right ventricular positive dP/dt, PH during exercise, exercise tolerance and the QOL in patients with severe COPD.

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