

Research in Review of INWA Scientific Committee:

Nordic Walking can safely improve the intensity of exercise training for healthy persons and patients with chronic heart failure.

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Journal Article Review:

Lejczak A, Josiak K, Węgrzynowska-Teodorczyk K, Rudzińska E, Jankowska EA, Banasiak W, Piepoli MF, Woźniewski M, Ponikowski P. (2016) Nordic Walking May Safely Increase the Intensity of Exercise Training in Healthy Subjects and in Patients with Chronic Heart Failure. *Advances in Clinical and Experimental Medicine : Official Organ Wroclaw Medical University* 2016 Jan-Feb;25(1):145-9. doi: 10.17219/acem/35094.

Purpose of the Study:

The primary purpose of the study was to assess the feasibility and safety of the NW technique under controlled laboratory conditions in patients with chronic heart failure (HF).

The second objective was to compare the effort intensity, measured by cardiopulmonary exercise testing, in comparison with standard walking in fit healthy volunteers and in patients with chronic heart failure.

Study Participants:

The study involved 12 healthy volunteers with high physical performance levels (a mean age of 30 ± 10 years, 5 men) and 12 men with stable systolic chronic HF who were being treated at the Outpatient Heart Failure Clinic at the 4th Military Hospital in Wrocław, Poland. All the HF patients were categorized in New York Heart Association (NYHA) class II; their median of peak oxygen consumption (peak VO_2) was 18.25 mL/kg/min. The HF patients in the study were treated in accordance with the recommendations of the European Society of Cardiology. After being enrolled in the study, all the participants were given practical training to familiarize them with the NW technique.

Procedure or Methods:

All the participants completed two randomly assigned submaximal walking tests (one with NW poles and one without) conducted on a level treadmill for 6 min at a constant speed of 5 km/h. The protocol resembled a 6-min corridor walk test, which is a standard diagnostic tool used in patients with HF. During each walking test a distance of 500 meters was reached.

During two consecutive cardiopulmonary exercise tests on the mobile treadmill, the following parameters were assessed:

- ECG,
- oxygen consumption (VO₂),
- carbon dioxide production,
- respiratory exchange ratio (RER),
- minute ventilation (VE),
- partial end-tidal CO₂ (PET CO₂),
- systolic blood arterial pressure (SBR),
- heart rate (HR),
- participants' subjective feelings of fatigue and dyspnea related to the task performed (measured using a simplified 10-point Borg Rating of Perceived Exertion scale)

Results:

Both healthy subjects and patients with chronic HF completed the walking tests with and without NW poles without complications. During and after the tests there were no symptoms of myocardial ischemia, increased effort dyspnea or significant arrhythmia. In the group of patients with HF, walking with the NW technique increased VO₂, RER, VE, PET CO₂, HR and SBR, in comparison to regular walking, and the fatigue grade according to the abridged Borg scale was higher than after regular walking. Dyspnea did not increase significantly with the NW technique. Similar changes were observed in the healthy subjects walking with the NW technique comparing with regular walking.

Discussion:

The results of this study indicate that walking with the NW technique is feasible, safe and well-tolerated both in healthy volunteers and in HF patients. None of study participants exhibited symptoms of increased dyspnea, symptoms of myocardial ischemia, signs of heart failure or significant arrhythmia while walking with the NW poles. Additionally, none of participants complained about discomfort or asked for an earlier end to the test.

Secondly, the results of this study indicate that the NW technique, compared to traditional walking, significantly increases the intensity of effort performed, as expressed by the more intense response of the participants' circulatory and respiratory systems. Although the current European Society of Cardiology recommendations do not establish an optimal form of physical activity that should be implemented as part of cardiac rehabilitation, and many studies in this field recommend continuous training of medium intensity, it seems that training sessions of higher intensity may provide significantly greater benefits. The Nordic walking technique increased the intensity of aerobic training in a safe and well-tolerated way in both healthy individuals and in patients with chronic heart failure.

Although the number of patients in the current study was relatively small, and HF subjects were all male, and all in NYHA functional class II, the authors believe that the data presented may contribute important information to current knowledge about cardiac rehabilitation in HF patients.