Uloga ergospirometrije u kardiološkoj rehabilitaciji

The role of cardiopulmonary exercise testing in cardiac rehabilitation

Alenka Brozina*,
Tatjana Zekić Varljen,
Koraljka Knežević,
Viktor Ivaniš,
Marko Boban,
Viktor Peršić

Thalassotherapia Opatija – Klinika za liječenje, rehabilitaciju i prevenciju bolesti srca i krvnih žila, Opatija, Hrvatska

Thalassotherapia Opatija – Clinic for treatment, rehabilitation and prevention of cardiovascular disease, Opatija, Croatia

KLJUČNE RIJEČI: ergospirometrija, kardiološka rehabilitacija, sekundarna prevencija.

KEYWORDS: cardiopulmonary exercise testing, cardiac rehabilitation, secondary prevention.

CITATION: Cardiol Croat. 2014;9(9-10):419.

***ADDRESS FOR CORRESPONDENCE:** Thalassotherapia Opatija, Maršala Tita 188/1, HR-51410 Opatija, Croatia.

Phone: +385-191-252-9187 / E-mail: alenkabrozina@gmail.com

Tjelovježba je jedan od ključnih elemenata kardiološke rehabilitacije i sekundarne kardiološke prevencije. Intenzitet tjelovježbe je povezan s poboljšanjem kardiorespiratornog sustava i smanjenjem neželjenih posljedica tijekom tjelovježbe. Planiranje intenziteta tjelovježbe je uključeno u nekoliko smjernica kardiološke rehabilitacije i sekundarne prevencije. Prije uključivanja bolesnika u proces kardiološke rehabilitacije nužno je kvantificirati kapacitet tjelovježbe, kronotropni i inotropni odgovor na fizičko opterećenje, monitorirati pojavu eventualnih aritmija te definirati znakove, simptome ili druge kliničke znakove rezidualne miokardijalne ishemije i odrediti intenzitet i trajanje tjelovježbe.

Ergospirometrijsko testiranje s detaljnom analizom ventilatornih parametara, određivanje vršnog primitka kisika ($\dot{V}O_{2max}$), prvog i drugog ventilatornog praga uz elektrokardiogram i dinamiku arterijskog tlaka tijekom i nakon opterećenja predstavljaju ključne varijable za planiranje intenziteta i trajanja individualizirane tjelovježbe za svakog bolesnika pojedinačno.

Danas je ergospirometrija, zbog niza varijabli koje procjenjuje, postala jedan od standarda u procjeni kardiorespiratornog sustava i planiranja individualizirane tjelovježbe u sklopu kardiološke rehabilitacije i sekundarne kardiološke prevencije.

Exercise training is a key issue in cardiac rehabilitation and secondary cardiac prevention. Exercise intensity is directly linked to both the amount of improvement in cardiorespiratory system and decreasing the risk of adverse events during exercise. Intensity ranges for training prescription are included in several guidelines regarding secondary prevention and cardiac rehabilitation. Before including a patient into cardiac rehabilitation process it is necessary to perform a functional evaluation to quantify exercise capacity, chronotropic and inotropic responses to exercise, and presence and severity of dysrhythmias, as well as identify signs, symptoms, or other clinical evidence of any residual myocardial ischemia and determine the intensity and duration of exercise.

Cardiopulmonary exercise testing with detailed analysis of ventilatory parameters, determination of peak oxygen consumption ($\dot{V}O_{2max}$), first and second ventilatory threshold, electrocardiogram and blood pressure kinetics during and after exercise are key variables for individualised exercise duration and intensity planning.

Cardiopulmonary exercise testing measures a broader range of variables to cardiopulmonary function and has become one of the standard for a direct assessment of the exercise intensity descriptors as a part of cardiac rehabilitation and secondary prevention.

LITERATURE

1. Wasserman K, Hansen JE, Sue DY, et al. Principles of Exercise Testing and Interpretation: Including Pathophysiology and Clinical Applications. 5th edition, Wolters Kluwer Health/Lippincott Williams & Wilkins, 2012.
2. Mezzani A, Agostoni P, Cohen-Solal A, et al. Standards for the use of cardiopulmonary exercise testing for the functional evaluation of cardiac patients: a report from the Exercise Physiology Section of the European Association for Cardiovascular Prevention and Rehabilitation. Eur J Cardiovasc Prev Rehabil. 2009;16(3):249-67.
3. Carvalho VO, Mezzani M. Aerobic exercise training intensity in patients with chronic heart failure: principles of assessment and prescription. Eur J Cardiovasc Prev Rehabil. 2011;18(1):5-14.

RECEIVED:
September 19, 2014