

# Balneoterapija kod bolesnika s reduciranom sistoličkom funkcijom lijeve klijetke

## Balneotherapy in patients with compromised left ventricular function

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**Cilj:** Pretražiti dostupnu literaturu o učinku balneoterapije, vježbanja u vodi i plivanja na bolesnike s disfunkcijom lijeve klijetke (LVD) i/ili kod stabilnih, kroničnih bolesnika sa zatajivanjem srca (CHF). Vježbanje u vodi do sada je preporučivano samo za nisko rizične srčane bolesnike, ali nije jasno je li isto sigurno i u bolesnika sa zatajivanjem srca. Ulaskom u vodu, tlak vode djeluje na površinu tijela tako da volumen krvi s periferije biva pomaknut prema centralnoj cirkulaciji, rezultirajući značajnim volumnim punjenjem srca, ali samo ako je tijelo uronjeno u vodu do vrata, što dovodi do povećanja svih šupljina uz povećanje veličine srca čak za 30% u 6 s.<sup>1</sup>

**Rezultati:** Iz dosadašnjih eksplorativnih studija o centralnoj hemodinamici i neurohumoralnom odgovoru na balneoterapiju proizlaze spoznaje: 1) Pacijenti s LVD imaju pozitivan učinak terapijskog kupanja na toplovdnoj kupelji uslijed smanjenja volumnog opterećenja zbog periferne vazodilatacije. 2) Kod koronarnih bolesnika s LVD, kod niskog opterećenja bicikliranja u vodi, srce radi učinkovitije nego kod niskog opterećenja bicikliranja izvan vode. 3) U bolesnika s prethodnim opsežnim infarktom miokarda, uranjanje u vodu do vrata rezultiralo je privremenim patološkim porastom srednjeg tlaka plućne arterije (mPAP) i srednjeg plućnog kapilarnog tlaka (mPCP). 4) Tijekom sporog plivanja mPAP i/ili PCP bili su veći nego kod vožnje biciklom izvan vode na opterećenju od 100 W. 5) U bolesnika s CHF, uranjanje u vodu do vrata rezultiralo je smanjenjem ili bez promjene udarnog volumena. 6) Čak i hemodinamski ugroženi bolesnici se osjećaju dobro tijekom vodene terapije. 7) Dekompenzirano zatajivanje srca je apsolutna kontraindikacija za kupanje ili plivanje. 8) Pacijent s teškim LVD ili CHF koji mogu spavati na ravnom, mogu se kupati u terapijskoj cijevi, uronjeni ne dublje od ksifoida. 9) Terapijske vježbe u bazenu mogu biti dopuštene pod uvjetom da je pacijent u uspravnom položaju uronjen samo do ksifoida.<sup>2</sup>

**Zaključak:** Na temelju navedenog, je li plivanje zaista sigurno u bolesnika s teškom LVD i/ili CHF, tek treba dokazati.

**Aim:** exploring literature on water immersion, balneo-therapy aqua exercise and swimming in patients with left ventricular dysfunction (LVD) and/or stable chronic heart failure (CHF). Aqua exercise is recommended for low-risk cardiac patients, but it is not clear whether it is safe, or what optimal water temperature in patients with CHF is. With water immersion, the water rises pressure on the body surface and blood volume shifts to the central circulation, resulting in marked volume loading of the heart, but only if immersion is up to the neck, with enlargement of all 4 chambers, in 6 seconds up to 30% increase in heart size.<sup>1</sup>

**Results:** Until now, based on exploratory studies of central hemodynamics and neurohumoral responses of aquatic therapies it is clear that: 1) In patients with LVD a positive effect of therapeutic warm-water tub bathing is due to afterload reduction caused by peripheral vasodilatation with warm water; 2) In coronary patients with LVD, at low-level water cycling, the heart is working more efficiently than at low-level cycling outside of water; 3) In patients with previous extensive myocardial infarction, immersion to the neck resulted in temporary pathological increases in mean pulmonary artery pressure (mPAP) and mean pulmonary capillary pressures (mPCP); 4) During slow swimming the mPAP and/or PCP were higher than during supine cycling outside water at a 100W load; 5) In CHF patients, neck-deep immersion resulted in a decrease or no change in stroke volume; 6) Even hemodynamically compromised, patients feel well during aquatic therapy; 7) Decompensated heart failure is an absolute contraindication for immersion or swimming; 8) Patient with severe LVD or CHF who can sleep in a flat position can bath in the tube, immersed no deeper up the xiphoid; 9) Therapeutic water exercise in a pool can be allowed, provided that the patient is in an upright position immersed no deeper than up to xiphoid.<sup>2</sup>

**Conclusion:** Based on these findings, whether swimming is truly safe, yet needs to be proven for patients with severe LVD.

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### LITERATURE

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