

# A gyógytorna és a gyaloglás direkt hatása a csontanyagcsere-markerekre és a sclerostin-szintre csontritkulásban

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## Összefoglalás

**Bevezetés:** Jelen tanulmány célja egy osteoporotikus betegek számára összeállított komplex gyógytorna-gyakorlatsor direkt hatásának vizsgálata a csontanyagcsere-tükröző biokémiai markerekre osteoporotikus/-peniás betegeknél, összevetve a gyaloglással.

**Módszer:** Összesen hatvan osteoporosissal/-peniával diagnosztizált, egyébként egészséges nőbeteg, melyből 30 fő gyógytornász által összeállított speciális tréninget, míg 30 fő ütemes gyaloglást végzett 45 percig. Mérésre került a csontspecifikus alkalikus foszfatáz (BALP), az I. típusú kollagén karboxi-terminális kereszt kötésű telopeptidje (CTX) és a sclerostin-szint tréning előtt és után, melyet kérdőív, osteodensitometriás vizsgálat egészített ki.

**Eredmények:** A BALP értékeket tekintve a gyógytornát végzők és gyaloglók csoportjában nem történt szignifikáns változás ( $p=0,763$  vs.  $p=0,115$ ), s nem mutatható ki szignifikáns különbség a csoportok között ( $p=0,343$ ). Ezzel szemben a CTX értéknél a tornászó és gyalogló csoport változása különböző ( $-8,82\% \pm 10,45\%$  vs.  $1,9\% \pm 2,19\%$ ;  $p=0,001$  vs.  $p=0,489$ ), s szignifikáns különbség mutatható ki a csoportok között ( $p=0,002$ ). A sclerostin-szint mindkét csoportban szignifikáns növekedést jelez ( $12,23\% \pm 16,72$  vs.  $27,25\% \pm 4,61\%$ ;  $p=0,067$  vs.  $p=0,017$ ). A két csoport között nincs szignifikáns különbség ( $p=0,319$ ).

**Konklúzió:** Ez a tanulmány megerősített, hogy a közepes intenzitású tréningnek és az ütemes gyaloglásnak van direkt hatása a csont biokémiai markereire. Osteoporosis/-penia esetén a nagy ízületeket átmozgató, nagy izomcsoportok munkáját igénybevevő tréning intenzívebb hatást váltott ki a csontbontó biokémiai markerre a gyaloglással szemben, míg a sclerostin-szintet kevésbé növelte, így hatékonyabb mozgásforma a gyaloglásnál. Az antisclerostin kezelés alkalmazásakor a jövőben érdemes lenne azt is megvizsgálni, hogy a fizikai aktivitás utáni közvetlen gyógyszerbevitel növeli-e a gyógyszer hatékonyságát.

**Kulcsszavak:** Osteoporosis, gyógytorna, BALP, CTX, sclerostin

## Direct impact of physical therapy and walking on bone metabolism markers and the sclerostin level in osteoporosis

### Summary

**Background:** The object of this work was to study the direct effects of a single bout of physiotherapeutic exercises on biochemical markers reflecting bone metabolism in patients with osteoporosis/-penia, in comparison to brisk walking.

**Methods:** Sixty otherwise healthy female patients diagnosed with osteoporosis/-penia were selected for the study. Thirty women carried out a specific training directed by a physiotherapist in the training-group, while thirty women were brisk walking for 45 minutes in the control-group. Bone specific alkaline phosphatase (BALP), C-terminal cross-linked telopeptide (CTX) and sclerostin levels were measured at the beginning and at the end of intervention and this was completed by a questionnaire and osteodensitometry.

**Results:** No significant change of BALP values occurred in training-group and control-group ( $p=0.763$  vs.  $p=0.115$ ). On the contrary, the changes of CTX were different in the two groups ( $-8.82\% \pm 10.45\%$  vs.  $1.9\% \pm 2.19\%$ ;  $p=0.001$  vs.  $p=0.489$ ), and there was a significant difference between the interventions ( $p=0.002$ ). The most remarkable change was seen in Sclerostin levels ( $12.23\% \pm 16.72\%$  vs.  $27.25\% \pm 4.61\%$ ;  $p=0.067$  vs.  $p=0.017$ ). There was no significant difference between the groups ( $p=0.319$ ).

**Conclusion:** This study reveals that the 60-minute, middle-intensity training and the brisk walking have an immediate effect on bone metabolic markers. In patients with osteoporosis, a training which set the big joints in motion and required the work of big muscle groups exerted a more intense effect on the biochemical marker of bone degradation, as compared to brisk walking, while it increased sclerostin levels to a lesser degree; therefore it has proven to be a more effective form of exercise than walking.

**Keywords:** Osteoporosis, physiotherapy, BALP, CTX, sclerostin

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