

Intense training without proper recovery may compromise bone health in elite rowers

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Bone mineral density, an indicator of bone strength, typically increases with regular exercise, acting as a protective mechanism against bone fractures and osteoporosis. But a new study suggests that the extended, high-intensity training sessions of elite athletes could reverse beneficial bone changes. Researchers from Brock University in Canada will present their findings today at the American Physiological Society (APS) annual meeting at Experimental Biology 2017 in Chicago.

For nine months, researchers monitored changes in osteoprotegerin (OPG, a protein that stops bone mineral loss) and sclerostin (SOST, a protein that inhibits new bone formation) levels in female rowers training for the 2016 Olympic Games. The research team chose this group of athletes because they often have a "high incidence of stress fractures and are at risk of [bone mineral density] loss," wrote Nigel Kurgan, first author of the study.

The rowers' training volume varied but averaged 1,086 minutes per week (about 18 hours). OPG—measured through blood samples—significantly decreased during this time, suggesting that the athletes were at risk for <u>bone loss</u>. SOST levels fluctuated, with the highest levels corresponding with the highest training volume and the lowest occurring when training volume was lower. Inflammation in the body also increased with more training and is thought to increase the expression of SOST, Kurgan noted.

The researchers assessed bone mineral density through dual X-ray



absorptiometry imaging before and after the trial period and found no change. Although <u>bone strength</u> remained steady, the fact that OPG and SOST expression changed significantly during heavy training may serve as a warning that "very intense training without adequate recovery period may lead to increased inflammation and subsequent bone resorption (loss)," Kurgan wrote.

More information: Nigel Kurgan, a graduate student at Brock University, will present "Changes in osteoprotegerin and sclerostin across a training season in Olympic female rowers" in a poster session on Tuesday, April 25, from 12:45 to 3 p.m. CDT in Hall F of the McCormick Place Convention Center.

Provided by Experimental Biology 2017

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