

High-Intensity Training Bests Moderate Exercise for Migraine

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VANCOUVER, Canada — People with migraine who exercise can reduce the frequency of their attacks, but doing so requires a really good workout a couple of times a week for the most benefit, a new study suggests.

Researchers at the University of Basel, Switzerland, report that both moderate continuous exercise (MCT) and high-intensity interval training (HIT) resulted in a significant reduction in migraine days among migraineurs, but HIT was associated with the highest reduction and good effects on other secondary endpoints.

"HIT is a safe training modality for migraineurs showing more pronounced effects on migraine attack reduction, cerebrovascular health indices and maximal oxygen uptake compared to MCT," the researchers, with lead author, Alice Minghetti, MSc, Department of Sport, Exercise and Health, University of Basel, Switzerland, concluded. "Thus, supervised aerobic exercise should be considered a complementary preventive and treatment strategy for migraineurs."

She presented the results during a poster walk here at the 18th Congress of the International Headache Society (IHC) 2017.

To test the efficacy of exercise in reducing migraine frequency, the researchers randomly assigned migraineurs to a 12-week regimen of HIT (n = 8), MCT (n = 8), or a control group with no exercise training (n = 8).

The HIT and MCT groups participated in exercise twice a week for 12 weeks. HIT consisted of 4 consecutive sets of running exercise for 4 minutes at 95% of maximal heart rate followed by 3 minutes at 75% of maximal heart rate, for a total exercise time of 28 minutes per session.

MCT consisted of running for 45 minutes at 70% to 75% of maximal heart rate. The regimens were designed to be equicaloric, meaning that participants expended the same amount of energy in each.

The study participants were 20 women and 4 men (mean age \pm standard deviation [SD], 36.4 \pm 11.0 years). Their mean body mass index was 22.9 \pm 4.0 kg/m². They kept a headache diary during a 4-week run-in period before the training intervention. The primary endpoint was the number of migraine days during the final 4 weeks of the intervention compared with the baseline period.

At the meeting, Minghetti showed data indicating a benefit of the HIT regimen on reducing migraine attack frequency.

Table. Migraine Frequency (Days per Month)

Exercise Group	Baseline (Mean \pm SD)	Postintervention (Mean \pm SD)	Effect Size (Standardized Mean Difference)	P Value
HIT	5.3 \pm 3.0	1.1 \pm 0.6	1.94	.004
MCT	4.6 \pm 2.3	3.6 \pm 2.7	0.40	
Control	3.6 \pm 2.7	2.5 \pm 2.2	0.45	

Using photographs of the retina, she also measured the diameters of vessels to calculate an arteriolar-to-venular diameter ratio (AVR), an indicator of cerebral microvascular health.

"AVR is a biomarker for cardiovascular risk," she explained. AVR less than 0.82 indicates a higher risk for diabetes, metabolic syndrome, general systemic inflammation, and cardiovascular risk. "As we know, migraine patients are at cardiovascular risk," she said.

In a lively exchange with Minghetti, poster walk moderator Stephen Silberstein, MD, Thomas Jefferson University, Philadelphia, Pennsylvania, interjected, "In other words, you want to dilate your arteries."

"And we have exactly that effect of a dilation of your arteries and constriction of venules in the high-intensity training group," she replied. "We also had it in the continuous training group but not as intensely, which means that the high-intensity input that it gives to your circulation, your system, is different stimulus than the continuous training."

Even though both exercise regimens were designed to have the same energy expenditure, [Minghetti attributed the greater benefit of the HIT regimen over the MCT one to an "afterburn" effect.](#)

"After you do high-intensity training, your body for a long period has to have certain adaptations in your system, so you need more oxygen after the workout than you do when you have just continuous, moderate-pace exercise," she said. "So especially for people who are busy or actually enjoy high intensity...it's a better exercise regimen."

Dr Silberstein said people need to spend "a lot more time thinking about the physiology of exercise. This is very important new information because people have been recommending moderate exercise several times a week, and I think the recent studies have clearly shown that once you build up to it, aggressive exercise is better for you long term at a shorter duration."

Ms Minghetti reports no conflicts of interest. There was no commercial funding for the study. Dr Silberstein is a consultant to Alder, Allergan, Autonomic Technologies, Avanir, Curelater Inc, Depomed, Dr Reddy's Laboratories, Ensured Inc, electroCore Medical LLC, eNeura Therapeutics, INSYS Therapeutics, Lilly USA LLC, Supernus Pharmaceuticals, Teva Pharmaceuticals, Theranica, and Trigemina Inc.

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