Very intense exercise-training is extremely potent and time efficient: a reminder

The literature contains a number of reports that 6–8 wk of either sprint interval training or “prolonged submaximal aerobic exercise training” promotes increased mitochondrial enzyme activity in skeletal muscle (5, 6). It has also been demonstrated that significant increases in skeletal muscle mitochondrial activity can be displayed after only 7–10 days of aerobic training when it is performed daily for 2 h at 65% peak oxygen uptake (11). It is likely that the potency of all-out sprint interval training is derived in large part from the high level of motor unit activation. All-out sprint training especially stresses recruitment and adaptation of type II (i.e., fast twitch) muscle fibers that are remarkably and equally responsive as type I (i.e., slow twitch) muscle fibers in their ability to increase mitochondrial enzyme activity to high absolute levels (4, 5, 7). In fact, the low-intensity aerobic exercise that is typically prescribed for endurance training or health is not very effective at increasing aerobic enzyme activity in type II muscle fibers, which comprise approximately one-half of the fibers within the thigh (vastus) and calf (gastrocnemius) muscle in most people (6). Thus low-intensity aerobic training is not a very effective or efficient method for maximizing aerobic adaptations in skeletal muscle because it generally does not recruit type II muscle fibers. The present report by Burgomaster et al. (2) provides a reminder of the effectiveness of sprint interval training, performed three times per week, and it demonstrates that large increases in aerobic enzyme activity and aerobic performance capacity previously measured after 7–8 wk (6) can occur after as little as 2 wk and only six sessions.

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REFERENCES


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