

SIMILAR REDUCTIONS IN OXYGEN DEFICIT IN RESPONSE TO ENDURANCE TRAINING IN OLDER AND YOUNG MEN

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The rate of adjustment of oxidative phosphorylation (VO₂ kinetics) is slowed in older compared to young adults. This slowed VO₂ response yields a greater O₂ deficit (for a given energy requirement) and thus an increased reliance on substrate-level phosphorylation during the exercise on-transient; this may compromise exercise tolerance in the elderly. Endurance training has been shown to speed VO₂ kinetics in older and young adults in as little as 3 weeks. Therefore, this study examined changes in the O₂ deficit in response to endurance training in older and young men. Eight healthy, active older (68±7 yrs; mean±SD) and 8 healthy, active young men (23±5 yrs) completed 2 fatigue-limited incremental ramp tests (pre-training and after 3 weeks training) to determine VO₂max and estimated lactate threshold (LT). Training was completed on a cycle-ergometer three times per week for 45 min at a power output corresponding to ~70% of VO₂max. VO₂ responses from square-wave transitions performed pre- and post-training at 80% LT were modeled as a mono-exponential using non-linear regression. Mean O₂ deficit (VO₂ amplitude•mean response time•1/60) was reduced ($p<0.05$) in both older (pre: 519±179; post: 416±108 mL) and young men (pre: 944±354; post: 784±193 mL), but the absolute reduction in O₂ deficit was not different between groups. The reduced O₂ deficit observed in older and young men suggests the potential for reduced fatigue during submaximal physical activities following just 3 weeks of endurance training. Supported by NSERC, CIHR, Standard Life Assurance Company of Canada