Running vs. Weightlifting


**Diverse patterns of myocardial fibrosis in lifelong, veteran endurance athletes.**

This study examined the cardiac structure and function of a unique cohort of documented lifelong, competitive endurance veteran athletes (>50 yr). Twelve lifelong veteran male endurance athletes [mean ± SD (range) age: 56 ± 6 yr (50-67)], 20 age-matched veteran controls [60 ± 5 yr; (52-69)], and 17 younger male endurance athletes [31 ± 5 yr (26-40)] without significant comorbidities underwent cardiac magnetic resonance (CMR) imaging to assess cardiac morphology and function, as well as CMR imaging with late gadolinium enhancement (LGE) to assess myocardial fibrosis. [...] An unexpectedly high prevalence of myocardial fibrosis (50%) was observed in healthy, asymptomatic, lifelong veteran male athletes, compared with zero cases in age-matched veteran controls and young athletes. These data suggest a link between lifelong endurance exercise and myocardial fibrosis that requires further investigation.

**Resistance exercise reverses aging in human skeletal muscle.**

Human aging is associated with skeletal muscle atrophy and functional impairment (sarcopenia). Multiple lines of evidence suggest that mitochondrial dysfunction is a major contributor to sarcopenia. We evaluated whether healthy aging was associated with a transcriptional profile reflecting mitochondrial impairment and whether resistance exercise could reverse this signature to that approximating a younger physiological age. Skeletal muscle biopsies from healthy older (N = 25) and younger (N = 26) adult men and women were compared using gene expression profiling, and a subset of these were related to measurements of muscle strength. 14 of the older adults had muscle samples taken before and after a six-month resistance exercise-training program. Before exercise training, older adults were 59% weaker than younger, but after six months of training in older adults, strength improved significantly (P<0.001) such that they were only 38% lower than young adults. As a consequence of age, we found 596 genes differentially expressed using a false discovery rate cut-off of 5%. Prior to the exercise training, the transcriptome profile showed a dramatic enrichment of genes associated with mitochondrial function with age. However, following exercise training the transcriptional signature of aging was markedly reversed back to that of younger levels for most genes that were affected by both age and
exercise. We conclude that healthy older adults show evidence of mitochondrial impairment and muscle weakness, but that this can be partially reversed at the phenotypic level, and substantially reversed at the transcriptome level, following six months of resistance exercise training.