



TITLE: Effects of resistance training on muscle strength, insulin-like growth factor-1, and insulin-like growth factor-binding protein-3 in healthy elderly subjects: a systematic review and meta-analysis of randomized controlled trials.

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ABSTRACT (upto 300 words)

Background; Findings regarding the effects of resistance training (RT) on muscle strength, serum level of IGF-1, and its binding proteins are contradictory. To resolve this contradiction, we performed a systematic review and meta-analysis to investigate the effects of RT on muscle strength, the levels of serum IGF-1, and IGF-binding protein-3 in the elderly and aged. **Materials and methods;** The PubMed, CINAHL, Medline, Google Scholar, and Scopus databases and reference lists of included studies were systematically searched to identify randomized controlled trials (RCTs) comparing subjects who underwent RT and control individuals up to May 15, 2020. This study was performed following the Preferred Items for Reporting of Systematic Reviews and Meta-Analyses guidelines. We identified and analyzed 11 eligible trials in this meta-analysis. **Results;** Pooled data displayed an overall significant elevation in IGF-1 (mean difference (MD): 17.34 ng/ml; 95% confidence interval (CI): 7.23, 27.46) and in muscle strength in leg press (SMD: 0.82; 95% CI: 0.30, 1.34) and bench press (SMD: 0.82; 95% CI: 0.42, 1.23) following RT. By contrast, the pooled estimate showed a non-significant elevation in IGFBP-3 (MD: 0.13 ng/ml; 95% CI: - 39.39, 39.65). Subgroup analysis revealed that the elevation in serum IGF-1 levels after RT was significant only in women (MD: 19.30 ng/ml); moreover, it increased after intervention durations of both > 12 weeks (MD: 21.98 ng/ml) and of ≤ 12 weeks (MD: 15.31 ng/ml). **Conclusion;** RT was associated with elevated muscle strength. Moreover, RT was correlated with increased serum levels of IGF-1 among women and among those who received the training for ≤ 12 weeks or > 12 weeks. Further studies are required to elucidate the mechanisms underlying the impact of RT on IGF-1, IGFBP-3, and muscle strength.

BIOGRAPHY (upto 200 words)

Mehrdad Fathi has completed his PHD at the age of 39 years from Kharazmi University, IRAN. He is scientific board an researcher in Ferdowsi University, IRAN. He has over 250 publications that have been cited over 787 times, and his publication h-index is 13. He has been serving as an editorial board member of several reputed journals.

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