Body Fat Gain Automatically Increases Lean Mass by Changing the Fat-Free Component of Adipose Tissue

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ABSTRACT

Estimating alterations in lean mass in response to various training interventions is a primary concern for many investigations. However, previous reports have suggested that lean mass estimates from weight loss interventions may be significantly altered by attempting to correct for changes in the fat-free component of adipose tissue (FFAT). This component, consisting primarily of water and protein, has been estimated as ~15% of adipose tissue (AT) mass. While a preliminary examination of this correction method has been conducted in the instance of weight loss, it has yet to be investigated after a period of purposeful weight gain and resistance training. **PURPOSE**: To examine the impact of corrections for FFAT on estimates of lean mass accretion during a period of weight gain and resistance training. **METHODS**: Twenty-one resistance trained males underwent 6 weeks of supervised training and followed a hypercaloric diet in order to elicit weight gain. Body composition was assessed pre- and post-intervention via dual energy x-ray absorptiometry (DXA). AT was estimated using DXA-derived fat mass (FM) in the equation: AT = FM/0.85. FFAT was then estimated via the equation: FFAT = 0.15 × AT. Lastly, FFAT was subtracted from DXA-derived lean mass (LM_{DXA}) to yield the new corrected lean mass value (cLM). Changes in LM_{DXA} and cLM in response to the training intervention were calculated, and dependent samples T-tests were employed to determine if significant differences were present between changes in LM_{DXA} and cLM. **RESULTS**: Significant differences ($p \leq 0.001$) were noted for estimates of LM gain, with a larger increase observed for LM_{DXA} as compared to cLM (LM_{DXA}: 2.42 ± 1.58kg; cLM: 2.14 ± 1.65kg). **CONCLUSION**: Correcting DXA-derived LM for the fat-free component of adipose tissue reduces the magnitude of LM accretion after a period of weight gain. However, while LM estimates did significantly differ, the small degree to which they differed indicates questionable practical relevance of such corrections in future investigations.