TACSM Abstract

Tracking Fat-free Mass Changes Over a Competitive Season in Elite Soccer Players

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ABSTRACT

The assessment of body composition in athletes throughout a competitive season can provide valuable information for coaches and practitioners as part of a general health assessment and to track training adaptations across a season. However, limited data are available to inform the capacity of common methods to accurately track longitudinal body composition changes in elite athletes. **PURPOSE:** The purpose of this study was to determine the validity of common body composition techniques and their associated prediction equations to track fat-free mass (FFM) in elite soccer players over a competitive season. **METHODS:** A sample of 21 elite soccer players participated in this observational, 4-timepoint study throughout a competitive season (T0 [mid-October], T1 [mid-December], T2 [mid-February], and T3 [end of April]). Participants underwent body composition assessments utilizing dual-energy X-ray absorptiometry (DXA), bioimpedance, and skinfolds. A modified 4-compartment (4C) model was produced using DXA and bioimpedance data, and several common skinfold prediction equations were also applied. Two-way repeated measures analysis of variance (ANOVA) tests were performed for FFM, with method and time as within-subject factors. Follow up testing was performed using one-way ANOVAs for simple main effects of method and time, as well as subsequent pairwise comparisons using t-tests. Statistical significance was accepted at $p<0.05$. **RESULTS:** Statistically significant condition × time interactions were observed for FFM ($p\leq0.0005$). Follow up one-way ANOVAs indicated simple main effects of time were present for FFM in all methods ($p\leq0.05$); follow up pairwise comparisons for FFM demonstrated significant differences between time points for only four methods (DXA, 4C model, Civars equation, and Reilly equation), with the largest number of distinct changes detected via DXA. Both the Civars and Reilly equations detected increases in FFM between T0 and T3 and between T2 and T3. **CONCLUSION:** These findings suggest that when more advanced methods are not available, the Civars and Reilly skinfold equations may be suitable options for tracking FFM changes in elite soccer players throughout a full competitive season.