Body Composition, But Not Gender, Predicts In-Season Changes in Aerobic Fitness in Collegiate Athletes
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The relationship between in-season changes in aerobic fitness and body composition in collegiate athletes is poorly defined.

**Purpose:** To evaluate in-season changes in aerobic fitness among collegiate athletes, and how these are influenced by gender, sport and body composition.

**Methods:** 50 NCAA Division 1 athletes [23 female (11 hockey, 12 soccer), 27 male (11 hockey, 16 soccer)] completed testing immediately before and after their competitive seasons for determination of lean body mass (LBM) and percentage body fat (BF%) by dual energy xray absorptiometry (DXA) and maximal treadmill testing for maximal aerobic capacity (VO₂max), time to exhaustion (Tmax), and ventilatory threshold (VT). Pre- and post-season fitness and body composition values were compared using paired t-tests. Multivariable regression analysis was used to identify independent predictors of in-season change in body composition using gender and sport as covariates, as well as in-season changes in fitness measures using sport, gender and body composition as covariates.

**Results:** Compared to preseason, post-season values for the entire group were lower for VO₂max (4.30±0.88 v 4.08±0.86 L/min, p=0.002), and unchanged for Tmax (16.5±2.2 v 16.1±2.3 min, p=0.13), VT (3.05±0.77 v 3.15±0.66 L/min, p=0.18), BF% (19.1±6.8 v 19.4±6.5 %, p=0.39) and LBM (56.7±10.5 v 56.3±9.8 kg, p=0.48) (p>0.05 for all). LBM was a significant, independent predictor of in-season changes in VO₂max (r²=0.33, p<0.001), Tmax (r²=0.19, p=0.003) and VT (r²=0.21, p=0.003). In-season change in BF% was not related to VO₂max (r²=0.04, p=0.29) or VT (r²=0.03, p=0.51), but was a strong predictor of changes in Tmax (r²=0.32, p<0.001). Gender and sport were not related to in-season changes in body composition or fitness variables (p>0.05 for all).

**Conclusion:** In collegiate intermittent sport athletes, in-season change in LBM explains a significant portion of changes in VO₂max and VT, whereas in-season changes in Tmax are independently predicted by changes in both LBM and BF%. In-season changes in aerobic fitness and body composition do not differ across sport or gender. This suggests that efforts to influence body composition during the competitive season can significantly impact aerobic fitness in intermittent sport athletes.