The Correlation of VO₂ Peak and Repeated Sprint Ability in College Hockey Athletes

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Abstract

Introduction

Many team-based sports require a blend of aerobic/anaerobic processes to maximize performance (1). Oxygen transport mechanisms of anaerobic base sports such as ice hockey, football, tennis, soccer, etc., have required aerobic training as a training modality as it is not what players experience during competition. Previous research has shown VO₂ peak to have a beneficial correlation with the ability to decrease fatigue. Therefore, there appears to be a platform for anaerobic athletes to increase oxygen capacity.

Methods Twenty-two collegiate hockey players, men (age 21±3), who currently play Varsity ice Hockey participated in this study. Subjects were familiarized with each testing protocol prior to data collection. Subjects completed the Peterson On-Ice Repeated Shift Test to assess fatigue index. Skating Multistage Aerobic Test (SMAT) to estimate oxygen capacity (VO₂ peak), and a cycle ergometer Wingate Peak Power test. Subjects were also assessed for body composition. Fatigue Index was calculated from the Peterson on-ice repeated shift test formula (Fatigue index = 100 x (Total sprint time – Ideal sprint time)) – (10).

Results A significant correlation was determined between VO₂ peak and percent fatigue decrease (3.37 ± 1.230) (r = 0.643, p < 0.001). Additionally, a significant correlation was determined between body composition (10.69 ± 2.610 and VO₂ peak (62.46 ± 5.66) (r = 0.665, p < 0.001).

Conclusion The primary factor that leads to fatigue at the muscular level is the accumulation of metabolic by-products. Athletes with higher oxygen uptake (VO₂ peak) may have the potential to delay the onset of fatigue. The delay of fatigue is induced by oxygen uptake kinetics, including an increase in blood flow to muscles, increased resynthesis of phosphocreatine, and an enhanced clearance of hydrogen and inorganic phosphate ions. The results of the present study display there may be a potential for an increased oxygen capacity to expedite O₂ kinetics and delay fatigue in hockey players.

References


