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Title: Indicators of ventilatory response: A new approach for the athletic performance assessment in professional football players

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Body: Aim. In this study the relationships among ventilatory parameters and exercise tolerance were evaluated after a period of exercise training in order to search for any other potential outcomes of the maximal exercise performance in serie A Italian football team. Methods. From September 2009 to September 2012, 90 football-players (age 25.9±4.0) were evaluated by spirometry (FEV1), electrocardiography and ergospirometry through an incremental symptoms-limited treadmill test to quantify indices of metabolic (maximum oxygen uptake, VO₂peak; length of anaerobic time for a respiratory ratio greater than one, LAT), ventilatory (equivalent method, VE/VCO₂peak; physiological dead space/tidal volume ratio, VD/VTpeak; breathing respiratory reserve, BRR) and cardiocirculatory (Heart Ratio, HR; oxygen pulse, VO₂/HRpeak) exercise performance. Moreover we measured maximal exercise velocity (MEV) in km/h. Results. Based on MEV values, subjects were divided into two groups (Hi-M: high-performance, 19-20 km/h; Lo-M: low-performance, 15-18 km/h). Hi-M showed higher minute ventilation at peak conditions compared to Low-M (158.3±19.5 vs 148.0±18.54, p=0.0203), and FEV1 (5.28±0.50 vs 4.89±0.52, p<0.001). The playing role did not significantly influence these results (2-way ANOVA and Holm-Sidak method, p<0.05). Moreover, a correlation between VO₂ (ml/kg/min) and VE (minute ventilation), both measured at peak conditions (r.57, p<.0001) was found. Conclusion. Parameters of ventilatory response can play a role in the assessment of exercise capacity in professional football players as key factors to improve the physical performance during exercise training in these athletes.