Work economy in assessment of relationship between aerobic capacity and performance in elite basketball players

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Introduction
It is still not clear if the physiological requirements of basketball are dominantly aerobic or anaerobic. Previous studies have found that anaerobic components are high positive predictors of performance, whereas aerobic capacity is reported to have negative correlation with playing time in male basketball players (Hoffman). However, conclusions are based upon results of American college basketball players and it should be taken into consideration that American basketball is quite different from European. Thus, the purpose of our study was to examine the relationship between aerobic capacity to performance and heart rate recovery from high intensity exercise in basketball players.

Methodology
Fifty-four first league basketball players from Serbia performed an incremental step test protocol on treadmill. We used standardized Nowacki protocol (9 km/h; 2%/2min.). Oxygen consumption was measured directly (Jaeger Oxycon pro, breath by breath method).

Results
Mean maximal oxygen consumption (VO2 max) value was 51.6 ± 4.3 ml kg⁻¹ min⁻¹. We found statistically significant correlation between work economy (WE) and average number of score points per game (p<0.05), as well as between WE and average playing time per game (p<0.05). Correlation between VO2 max and playing time and average score points was positive, but not statistically significant (r=0.17 and r=0.14, respectively; p>0.05). Also, players with lower WE values (e.g. better work economy) had more rebounds per game (p<0.05). Difference between maximal hearth rate achieved (HR peak) and hearth rate in first minute of recovery (∆ HR 1 min.) significantly correlates with VO2 max (r=0.45; p<0.05) and WE (p<0.05).

Discussion/Conclusion
Our results show that aerobic capacity is important indicator of performance in basketball players. However, using VO2 max as single variable in determining aerobic capacity may lead to misinterpretation of results. Therefore, we would like to point out significance of WE determination within standard evaluation of aerobic profile in elite basketball players.

References