The aim of this study was to verify the validity of the curvature constant parameter ($W'$), calculated from 2-parameter mathematical equations of critical power model, in estimating the anaerobic capacity and anaerobic work capacity from a table tennis-specific test. Specifically, we aimed to i) compare constants estimated from three critical intensity models in a table tennis-specific test ($C_f$); ii) correlate each estimated $W'$ with the maximal accumulated oxygen deficit (MAOD); iii) correlate each $W'$ with the total amount of anaerobic work ($W_{ANAER}$) performed in each exercise bout performed during the $C_f$ test. Nine national-standard male table tennis players participated in the study. MAOD was 63.0(10.8) mL·kg$^{-1}$ and $W'$ values were 32.8(6.6) balls for the linear–frequency model, 38.3(6.9) balls for linear–total balls model, 48.7 (8.9) balls for Nonlinear–2 parameter model. Estimated $W'$ from the Nonlinear 2-parameter model was significantly different from $W'$ from the other 2 models ($P<0.05$). Also, none $W'$ values were significantly correlated with MAOD or $W_{ANAER}$ ($r$ ranged from −0.58 to 0.51; $P>0.13$). Thus, $W'$ estimated from the 2-parameter mathematical equations did not correlate with MAOD or $W_{ANAER}$ in table tennis-specific tests, indicating that $W'$ may not provide a strong and valid estimation of anaerobic capacity and anaerobic capacity work.

By:

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