THE DEVELOPMENT OF A RELIABLE AND VALID NETBALL INTERMITTENT ACTIVITY TEST

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ABSTRACT

The purpose of the present investigation was to identify the exercise intensity of netball match play in order to assist in the development of a Netball Intermittent Activity Test (NIAT). A further aim was to assess the criterion validity and the test-retest reliability of the NIAT. Eleven female netball players (21.4 ± 3.1 years, 1.73 ± 0.06 m, 69.3 ± 5.3 kg and 48.4 ± 4.9 $ml \cdot kg^{-1} \cdot min^{-1}$ mean ± SD, age, height, body mass and $\dot{V}O_{2max}$, respectively) volunteered to participate in the study. Heart rate data was recorded for all participants from at least two full 60 minute games during Premier Club competition. Individual maximum heart rate values were acquired for all subjects from the performance of the Multistage Fitness Test, and used to transform heart rate recordings into percent maximum heart rate ($\%HR_{max}$). Patterns in $\%HR_{max}$ were used to indicate positional grouping when developing the NIAT from time motion analysis data. Subjects performed two trials of the NIAT separated by at least seven days. Physiological and performance markers were measured systematically throughout the NIAT. Exercise intensity as denoted by $\%HR_{max}$ significantly decreased from the first half of match play to the second half (90.4 ± 2.7% v 88.3 ± 2.8%; $p<0.05$). Significant differences ($p<0.05$) were observed between positional groups and led to the grouping of Defence (D), Centre Court (CC), and Attack (A) players for NIAT performance. Comparisons of $\%HR_{max}$ between match play and NIAT performance indicated that the NIAT had good criterion validity for D (*match Mdn* = 92.52% vs. *NIAT Mdn* = 86.27%, $p>0.05$) and A (*match Mdn* = 86.95% vs. *NIAT Mdn* = 82.93%, $p>0.05$) players, but that $\%HR_{max}$ during the NIAT (*Mdn* = 79.70%) was significantly lower than match play (*Mdn* = 89.70%) for CC group ($p<0.05$). Measures of 5 m sprint performance (1.27 ± 0.06 s v 1.25 ± 0.06 s; $p>0.05$; $r=0.66$, $p<0.001$), vertical jump height (29.12 ± 4.17 cm v 28.82 ± 3.60 cm; $p>0.05$; $r=0.91$, $p<0.001$), circuit time (107.49 ± 3.22 s v 107.89 ± 4.27 s; $p>0.05$; $r=0.72$, $p>0.001$) and $\%HR_{max}$ (82.56 ± 4.66% v 81.03 ± 4.13%; $p>0.05$; $r=0.82$, $p<0.001$) for NIAT1 *vs.* NIAT2 indicated good test-retest reliability. These data suggest that netball players experience a reduction in exercise intensity over the duration of a game, with exercise intensity being related to on-court position. Whilst the NIAT appears to be a repeatable activity pattern, it is not a good simulation of physiological strain for all positional groups. More work is required in order to create a netball simulation that is both reliable and valid for all players.

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