

Original Research

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Optimal Peak and Mean Power on the Wingate Test: Relationship With Sprint Ability, Vertical Jump, and Standing Long Jump in Boys

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The first purpose of the present study was to test sensitivity of the Wingate anaerobic test (WAnT) to alterations in resistance settings. The second purpose was to investigate whether using optimal braking force on WAnT enhances its relation with a 50-m dash, a vertical jump (VJ), or a standing long jump (LJ) tests. Twenty-three 12 year-old boys performed a 50-m dash, VJ, LJ, and WAnT using four braking force resistances (BFR: .065, .070, .075, and .080 kp/kg BM). Results revealed significant ($p \leq .05$) differences among the four BFRs in peak power (PP) and in mean power (MP). Post hoc tests indicated significant differences among all of the four BFRs in PP and between the 0.065 and both the 0.075 and the 0.08 kp/kg BM in MP. Results of Pearson correlation coefficients indicated that using the optimal BFR for both PP and MP enhanced their relation with performance during the 50-m dash, VJ, and LJ tests. Also, partial correlation coefficients, controlling for body weight, height, percent fat, or body mass index supported these findings. It was concluded that for untrained, healthy 12-year-old boys, WAnT is sensitive to incremental alterations in resistance settings ranging from 0.065 to 0.080 kp/kg body mass. To be more specific, PP is sensitive to small increments in BFR, while MP is only sensitive to larger increments in BFR. Furthermore, optimizing resistance settings on WAnT enhances its relationship with anaerobic performance tasks, such as the 50-m dash, the VJ, and the LJ.

Introduction

The most popular anaerobic test is the Wingate anaerobic test (WAnT; 22). Indeed, this test has been examined more extensively than any other anaerobic performance test for several pediatric populations and found to be valid and reliable (21). However, choosing a force setting that would elicit the highest possible peak and mean power from the WAnT has been a concern over the last few years and, as

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