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Abstract

The aim of the study was to provide comparative information on Wingate Anaerobic Test (WAnT) variables in boys with intellectual disability (ID) and without ID. Nineteen boys with ID (age: 15.5 ± 1.0 yrs; body mass: 47.4 ± 12.6 kg; stature: 1.59 ± 0.07 m; body fat: 19.3 ± 9.2 %), with appropriate consent, from two Movement for the Intellectual Disability of Singapore (MINDS) schools participated in the study. The IQ range for boys with ID was between 30–50 (i.e. moderate ID). Another group of 20 boys without ID (age: 15.4 ± 0.4 yrs; body mass: 57.9 ± 11.8 kg; stature: 1.69 ± 0.07 m; body fat: 17.0 ± 7.0 %) from a secondary school also participated in the study. The subjects' body composition was determined using dual-energy X-ray absorptiometry (DXA). Both cohorts of boys each performed and completed two 30-second WAnTs. A two-minute post exercise blood sample was also obtained using the finger stick method, and was subsequently analysed for whole blood lactate concentration [BL].

Results of the test-retest computations for peak and mean power, and for indicators of reliability, agreement and variation are summarised in tabular form.

Variable	Intra-class reliability coefficients	95% limits of agreement	Co-efficient of variation
Mean power [MP] (Boys with ID)	0.95*	-23W to 16W	55%
Mean power [MP] (Boys without ID)	0.97*	-22W to -5W	19%
Peak power [PP] (Boys with ID)	0.93*	-51W to -5W	42%
Peak power [PP] (Boys without ID)	0.90*	-40 W to 7W	19%

*Significant at $p < 0.05$

Results of the WAnT performances for boys with and without ID are depicted:

Variable	Boys without ID (n = 20)	Boys with ID (n = 19)	Effect size
Absolute mean power (W)	459 ± 91	155 ± 74*	3.5
Mean power (W/LLMM ⁻¹)	28.1 ± 2.7	12.5 ± 5.1*	4.4
Mean power (W/LLMM ^{-2.5})	0.44 ± 0.09	0.29 ± 0.13*	1.4
Absolute peak power (W)	619 ± 129	219 ± 87*	3.4
Peak power (W/LLMM ⁻¹)	38.0 ± 4.2	17.9 ± 5.5*	4.4
Mean power (W/LLMM ^{-2.3})	1.03 ± 0.19	0.69 ± 0.24*	1.6
Fatigue index (%)	55 ± 13	61 ± 25	0.35
Lactate sampling at two min post exercise (mmol/L)	6.9 ± 2.2	3.8 ± 2.1*	1.4

LLMM= Lower limb muscle mass

*Significantly different at $p < 0.05$.

Results of the best predictors for boys with and without ID are as follows:

Variable	Equation	r	r ²
Boys without ID	MP = $e^{-5.313} \cdot \text{LLMM}^{1.179}$	0.87	0.75
	PP = $e^{-4.974} \cdot \text{LLMM}^{1.175}$	0.85	0.73
Boys with ID	MP = $e^{-9.955} \cdot \text{LLMM}^{1.580}$	0.49	0.24
	PP = $e^{-6.615} \cdot \text{LLMM}^{1.270}$	0.60	0.36

The study showed that with appropriate guidance, encouragement and habituation, boys with ID were able to perform the WAnT without any dire consequences and with reasonable levels of reliability and agreement. Boys without ID had higher PP, MP and BL concentration than boys with ID. The best predictors for the WAnT performance variables were formulated for both populations. Future studies should look into the appropriate training programmes to improve the anaerobic performances of boys with ID. Future studies also need to include individuals with ID of different ages, gender and level of ID if a more complete understanding of this population is to be obtained.