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PURPOSE

Competitive collegiate mountain biking includes subdisciplines of cross-country, short track, downhill, and dual slalom. While a variety of physiological variables determine successful performance within the sport, power output is a mainstay between all subdisciplines. The purpose of this study was to compare two popular measurements of peak power assessment.

METHODS

Eight collegiate highly trained competitive cyclists (6 men; Mean age ± SD; 19 ± 1.5 years; Table 1 provides anthropometric measures) participated in two testing sessions, each measuring power output (Table 1). For session 1, participants first completed a series of countermovement jumps using the Just Jump Plyometric Mat (Power Systems). Participants were familiarized with the jump protocol prior to testing and instructed to keep their hands on their hips while they performed the countermovement jumps. For session 2, participants performed a 30-second Anaerobic Wingate Test (WAnT) on a Velotron Cycle Ergometer (SRAM) with a resistance load set at 10% of the participant's bodyweight. The tests consisted of a brief 2-minute warm-up at 100 watts, followed by a 20-second lead-in time to the test at 150 watts. Following the 20-second lead in time, participants continued to cycle and an 8-second countdown was given. Participants were verbally encouraged to begin pedaling as fast as possible. Following the 8-second countdown, the load was engaged for the 30-second test duration. While all participants were instructed and familiarized with the Wingate testing protocol, this was the first Wingate test experience for all participants.

RESULTS

Statistical analysis showed a statistically significant ($p = .03$) strong to very strong correlation ($r = .757$) between the peak power output values (Mean ± SD; 1208.75 ± 256.68 Watts) from the 30-second Wingate Test and the peak power outcomes for the countermovement jump test (Mean ± SD; 4819.75 ± 1905.53 Watts).

Participant	Height(cm)	Weight(kg)	Bodyfat(%)	CM Jump Power(W)	Wingate Peak Power
1	177.01	81.3	12.3	5002	1275
2	184	101.9	21.9	4991	1457
3	181.99	79.1	8	5452	1423
4	171.5	73.1	10	7081	1216
5	159	55	21.6	3157	969
6	172.01	73.6	11.5	7391	1394
7	178	69.8	5.6	3699	1234
8	151.99	48.3	15.9	1785	702

CONCLUSIONS

Both CMJ and the 30-second test have both been proven as valid tests for power, and results from this study suggest a very strong correlation between these two tests when measuring peak muscular power.

PRACTICAL APPLICATIONS

If a coach or strength and conditioning professional does not have access to the needed equipment to administer a Wingate test, the CMJ test appears to be a great alternative to measure and assess peak muscular power. Additionally, coaches and professionals can test larger groups of individuals in a shorter amount of time using CMJ tests to measure peak power. Finally, if multiple performance tests needed to be performed in the same testing session, CMJ tests are less metabolically demanding, and therefore, less likely to impede performance on subsequent testing within the same session.

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