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Modelling of critical power from road data

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Abstract

Purpose: To investigate a novel CP road testing protocol.

Methods: Laboratory determined CP values using a 30 min intra-trial recovery period (Bishop & Jenkins, 1995: European Journal of Applied Physiology and Occupational Physiology, 72 (1-2), 115-120) were compared with those determined in the field, i.e. on the road. The experiment comprised of planned maximal efforts of 12 min, 7 min and 3 min with a 30 min recovery period between efforts. Linear regression was used to determine CP using the work-time equation (W = CPt + W \square).

Results: There was no significant difference between laboratory and road CP values. The mean difference between the two environments was 0 ± 5.5 W. The standard error of estimates was 1.7% and limits of agreement were -10.8 - 10.8 W (Fig. 1).

Discussion: Results suggests that CP can be tested on the road. Gonzales-Haro accepted their incremental velodrome field test as being valid with reported limits of agreement of 130 W to – 24 W and a random error of 13.9%. Our limits of agreement values are considerably higher and standard error of estimate values are considerably lower than those reported by Gonzales-Haro. The experimental protocol provides a practical and easy to use alternative to the conventional testing protocol for coaches and athletes when determining CP in on the road.

Conclusion: The aforementioned research provides support for the acceptance of road CP performance testing using a 30 min inter-maximal effort recovery period.

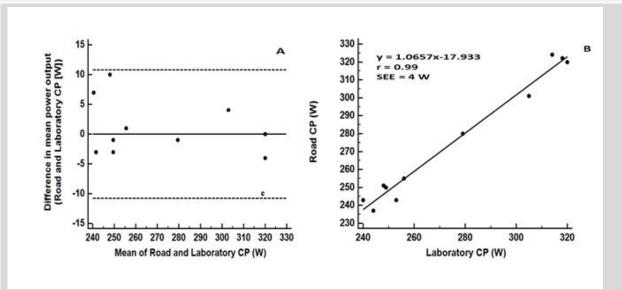


Fig. 1 Bland-Altman plots of the limits of agreement (panel A) and the relationship (panel C) between laboratory CP and road CP (W). In panel A the horizontal line represents the mean difference between laboratory CP and road CP, and the dashed line represents 95% LoA.



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