Pacing profile by classification in elite paracycling

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INSEP

INTRODUCTION:
Pacing profile in cycling and paracycling studies can provide insight into the underlying physiological processes during specific events. In elite paracycling, it can also give insight into the effect of classification (thus disabilities) on cycling performance. Furthermore, analysis of the pacing strategies employed by successful athletes can provide information on optimal pacing strategy for a given event, and suggest opportunities for performance enhancement. This study aims to 1/ investigated the effect of classification on the pacing profile used in paracycling track events. 2/ analyze the pacing strategy of world championship medalists.

METHODS:
All the results and split times (every 125m) of male (525 performances) and female (261 performances) paracyclists in 6 world championships from 2014 to 2022 have been collected on the RSStiming website. Data are based on the 1km Time Trial (TT), 500m TT and Individual Pursuit (IP) events. Analysis of variance with repeated measures was used to examine differences in 250m split times during IP events and differences in 125m split times during the 1km TT and 500m TT. Post-hoc analysis was performed using Student's t test for paired data, with alpha adjusted by the Bonferroni method. In order to analyse the decay kinetics of the speed over the course of an event, a speed decrease index (SPI) was calculated for each performance. Finally, to investigate if there were any differences in the pacing strategies between medalists and non medalist. The performance data from each world championships was split into 3 groups (Top 3; Top 8; Top 20) in each classification. A pairwise Wilcoxon test with Bonferroni adjustment to identify differences between each performance group was used.

RESULTS:
First lap mean speed (0-250m split) and second lap (375-500m) was significantly different between classification ($p<0.05$) in each male and female event. In 1km TT, each classification reaches mean top speed in 375-500m before losing speed suggesting an identical pacing strategy. Pacing profile in each event suggest an «all-out» strategy and was not different between classifications. No significative difference between classification was found in SPI in each event ($p > 0.05$). However, a significative difference was found between the Top 3 and Top 8 SPI ($p<0.05$) in male and female individual pursuit events in C5 and C4 classification.

CONCLUSION:
This study provides insights into the impact of paracycling classification system in para-cycling. In C5 and C4 classification, this study suggests that the best performers seem to be differentiated by their ability to not lose velocity during the race. The significant differences between each category during the first 2 laps indicate an impact of the classification (and thus of the disability) on the start.

Topic: Statistics and Analyses

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