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Conference abstract

Freely chosen cadence is increased across repeated bouts of submaximal ergometer cycling

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Abstract: The aim of the present study was to investigate whether the phenomenon of repeated bout rate enhancement occurs during submaximal ergometer cycling. In the present context, repeated bout rate enhancement is defined as an increase of the freely, or spontaneously, chosen cadence during repeated bouts of pedalling. This is for example relevant to study since cadence, and thereby the described phenomenon, can affect physiological and biomechanical responses.

Recreationally active individuals (n=27) performed five consecutive 5-min bouts of ergometer cycling at 100 W. Cadence was freely chosen during all cycling. The bouts were separated by 10-min rest periods. Cadence, heart rate, tympanic temperature, rate of perceived exertion, and pedal force profile characteristics were determined.

The primary result was that cadence at the end of 5. bout (78±23 rpm) was statistically significantly higher than at the end of all other bouts. Overall, the cadence at the end of 5. bout was 15.6%±20.4% higher than at the end of 1. bout. The altered rhythmic motor behaviour was accompanied by a statistically significant effect of bout on heart rate, which amounted to 125±17 and 131±26 beats per min at the end of 1. and 5. bout, respectively. In addition, there was a statistically significant effect of bout on pedal force.

It is possible that the observed alteration of cadence occurred as a nonconscious rhythmogenesis process. A neuromodulation in form of a net excitation of relevant parts of the nervous system might explain the altered cadence. The results might have implications for testing and research.

In conclusion, the phenomenon of repeated bout rate enhancement during submaximal ergometer cycling was observed in the present study. Thus, the freely chosen cadence showed an increase of on average about 15%, or 10 rpm, as accumulated values across the five consecutive bouts of ergometer cycling.

Keywords: motor control; pedal rate; pedaling frequency; rhythmogenesis; testing