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**Cycling performance and mechanical variables using a new prototype chainring.**

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The primary aim of our study was to examine supra-maximal cycling performance and related mechanical variables in trained cyclists using a new prototype chainring (PC) designed to produce a higher mean net torque (T (N mean)) than a standard chainring (SC). The main feature of the PC is that crank-arm alignment and lever-arm length change as a function of the crank angle during the pedaling cycle. The PC presents two features theorized to effect cycling performance: (1) out of line of pedal cranks resulting in an decrease in the dead points, and (2) a change in crank arm length inducing a torque different from that of SC during the down- and up-stroke of the pedaling cycle. To investigate this theory, we examined eight male cyclists who performed a 1-km "all-out" cycling test in the following order: SC, PC, and SC. Performance was measured as the time (s) to complete the 1-km test. Mechanical variables included torque (N m(-1)), crank velocity (rad s(-1)), and power output (W). We performed our statistical analysis using a two-way ANOVA for repeated measurements and Newman-Keuls post hoc assessment. Our results showed that performance was similar for SC (69.41 +/- 6.69 s) and PC (73.33 +/- 4.58 s). Torque, crank velocity, and power output were also similar throughout ( $P > 0.05$ ). We conclude that despite the theoretically benefits proposed by the inventors the new PC investigated in our study failed to improve cycling performance or mechanical variables during a supramaximal test when compared with SC.