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Exercise intensity and load during uphill cycling in professional 3-week races.

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This study examined the exercise intensity and load of the mountain passes of the major 3-week races according to their difficulty (length and slope) and position within the stage, using competition heart rate (HR). Sixteen world-class cyclists performed a laboratory test to assess maximal power output (W (max)), maximal HR (HR(max)), HR reserve (HRR), onset of blood lactate accumulation (OBLA), lactate threshold (LT) and a HR-power output relationship. HR was monitored during 68 OFF, 172 FIRST, and 134 SECOND category passes. Passes were also classified as BEGINNING, MIDDLE or END if they were placed in the first, second or final thirds of a stage, respectively. The training impulse (TRIMP) was calculated from HR and climb duration. %HRR was significantly higher in OFF and FIRST (77 +/- 7% in both), than SECOND (74 +/- 7%). Competition HR relative to HR(OBLA)R and HR(LT)R were higher in OFF (86 +/- 8, 98 +/- 11%) and FIRST (87 +/- 7, 100 +/- 11%) than SECOND (83 +/- 9, 95 +/- 13%). %HRR was lower in OFF situated in BEGINNING (66 +/- 1%) than in MIDDLE (82 +/- 5%) and END (77 +/- 7%); in FIRST situated in BEGINNING (74 +/- 9%) than in MIDDLE (79 +/- 5%); and in SECOND situated in BEGINNING (69 +/- 9%) compared to END (75 +/- 8%). The amount of TRIMP in OFF, FIRST and SECOND were 115 +/- 30, 72 +/- 29 and 41 +/- 19 (P < 0.05). In conclusion, the present study showed that mountain passes are highly demanding and that their intensity is related not only to the difficulty of the ascents but also to the position within the stage. The knowledge of these demands could be useful for planning pre-competition training strategies.