

原 著

ローラースキー時の滑走速度を高めるためのキネマティクスの要因

Kinematic factors for an increase in roller skiing speed

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Abstract

The purpose of this study was to investigate kinematic factors for an increase in speed during level roller skiing with a diagonal stride. Two-dimensional kinematics were recorded in seven male collegiate cross-country ski athletes who roller skied with a diagonal stride at the paced speeds on a level track. Roller skiing speed had positive correlations with cycle length and cycle rate ($r = 0.865, p < 0.001$; $r = 0.906, p < 0.001$) and a negative correlation with cycle time ($r = -0.900, p < 0.001$). A highly positive correlation was found between roller skiing speed and maximal horizontal velocity ($r = 0.988, p < 0.001$). Maximal horizontal velocity negatively correlated with duration of double-support phase and transition phase and mean acceleration of the roller ski during double-support phase ($r = -0.407, p < 0.05$; $r = -0.915, p < 0.001$; $r = -0.908, p < 0.001$, respectively). Consequently, a dynamic forward leg swing would result in longer cycle length and hence increasing roller skiing speed. Greater deceleration of the roller ski before kicking and more rapid movements of kicking and transition to the opposite roller ski would cause acceleration of roller skiing speed. In addition, it is suggested that the above movements for shorter duration are required to increase roller skiing speed.

キーワード ダイアゴナルストライド, サイクル長, サイクル時間, サイクルレート, 水平最大速度

diagonal stride, cycle length, cycle time, cycle rate, maximal horizontal velocity

1. はじめに

クロスカンTRIESキー競技は長年に渡って、男子は10 kmから50 km, 女子は5 kmから30 kmの長距離で競われるディスタンス競技を中心に行われてきた。しかし最近になり、1 km程度の短いコースで争うスプリント競技が実施

されるようになった。滑走距離が短縮されたことによりレースは高速化し、滑走速度の上昇はクラシカル走法とスケーティング走法、それぞれの走法の滑走テクニックに変容をもたらした。

最近の滑走テクニックの特徴について、Stöggl et al. (2008) はスケーティング走法の従

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