Stride pattern modifications during sprints repeated in prepubertal boys

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Résumé

Introduction :

The sprints represent a primary solicitation in many children's physical activities. However, the repetition of sprints could lead to fatigue (1), affecting their execution. Thus, this study aimed to characterize the changes in stride patterns during sprint repetitions in prepubertal boys.

Material and methods :

Twenty prepubertal boys participated in this study (10.1 years old ± 1.5). The protocol consisted of one experimental session that included 15 maximal linear sprints over 20 meters, with one minute of recovery between each sprint. Times at 20, 10, and 5 m were collected using photoelectric cells. Additionally, stride parameters such as step velocity, step amplitude, contact time, and step frequency were measured using serial Optojumps. These parameters were analyzed by separating the first six steps (acceleration phase: ACC) from the last six steps of the sprint (velocity phase: VEL). The effect of sprint repetition was analyzed for all variables using a one-way analysis of variance.

Results :

The 20 m and 10 m times increased significantly ($p = 0.002$; $+1.80\% \pm 3.18$; $p = 0.034$; $+2.13\% \pm 2.65$, respectively), while no modification was observed for the 5 m time. The step velocity decreased during the VEL phase ($p = 0.038$), but no modification was observed for the ACC phase ($p = 0.376$). During the VEL phase, the step amplitude remained unchanged ($p = 0.756$), while the contact time increased ($p = 0.027$) and step frequency decreased ($p = 0.008$). In the ACC phase, both step amplitude and contact time increased ($p = 0.029$ and $p = 0.014$, respectively), while frequency decreased ($p < 0.001$).

Discussion:

It is reasonable to suppose that prepubertal boys presented a great maintenance of the acceleration capacity, because the force production, which is a main factor of the acceleration phase, is few impacted by fatigue in prepubertal children (2). However, the velocity phase represents plyometric solicitations, in which prepubertal children are not efficient (3).

*Intervenant

Conclusion :

The present results highlighted the presence of modifications of the stride pattern during sprint repetition in prepubertal boys. However, their influence looks less deleterious on the acceleration phase of the sprint than during the velocity phase, which could suggest prioritizing short sprints in the prepubertal boys' training.

References:

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