

AGE-RELATED DIFFERENCES IN SPRINT PERFORMANCE IN HIGHLY-TRAINED YOUNG SOCCER PLAYERS

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Introduction

The ability to perform high-speed running actions during a soccer match is an important prerequisite for successful participation in the sport [1]. This study was undertaken to determine age-related differences in sprint velocity and selected stride parameters in young soccer players.

Methods

Sprint performance of 84 highly-trained young male soccer players (Under 14 (U14), n=28; Under 16 (U16), n=32; Under 18 (U18), n=24) was measured by a laser speed measurement device (Laveg, Jenoptik, Germany) and filmed by a high-speed video camera (300 fps) which was panned to follow the players throughout the sprints. Velocity (V), stride rate (SR), stride length (SL), contact time (CT), and flight time (FT) during the acceleration (0-10 m) and the peak velocity (fastest 10m split time) phases of the 40m sprint were determined [2]

Results & Discussion

Age differences in velocity during the acceleration and the peak velocity phase were on average 11.5% and 18.3% between U14 and U16 and 12.6% and 6.2% between U16 and U18, respectively (Table 1). The differences in acceleration and peak velocity between the U14 and U16 groups were primarily related to a longer SL in the latter while the difference between the U16 and U18 groups were mainly related to a higher SR and a shorter FT in the latter (only significant for the acceleration phase).

Table 1. Comparison of selected performance parameters of the 40-m run between the age groups (mean±SD).

Parameters		U14 (n=28)	U16 (n=32)	U18 (n=24)	Post hoc Tests (Bonferroni)
Velocity (m·s⁻¹)	During acceleration (0-10 m)	4.97 ± 0.20	5.54 ± 0.24	6.24 ± 0.91	U18>U16>U14*
	During peak velocity phase	6.78 ± 0.33	8.02 ± 0.49	8.52 ± 0.48	U18>U16>U14*
Stride rate (Hz)	During acceleration (0-10 m)	4.82 ± 0.23	4.83 ± 0.24	5.16 ± 0.30	U18>(U16=U14)*
	During peak velocity phase	5.86 ± 0.68	6.00 ± 0.94	6.42 ± 1.07	U18>U14=U16*
Stride length (m)	During acceleration (0-10 m)	1.03 ± 0.05	1.15 ± 0.06	1.21 ± 0.19	(U18=U16)>U14*
	During peak velocity phase	1.16 ± 0.13	1.35 ± 0.20	1.34 ± 0.20	(U18=U16)>U14*
Contact time (ms)	During acceleration (0-10 m)	157 ± 10	159 ± 14	155 ± 12	ns
	During peak velocity phase	134 ± 8	132 ± 12	128 ± 11	ns
Flight time (ms)	During acceleration (0-10 m)	78 ± 9	77 ± 11	70 ± 8	U18<(U16=U14)*
	During peak velocity phase	106 ± 11	108 ± 10	102 ± 9	ns

* Significant difference (p<0.05)

Conclusions

Our findings indicated that the main stride parameter to explain the differences in sprint running (both acceleration and peak velocity) among young soccer players varies with age: the younger players rely more on the SL and the older ones more on the SR.

Reference

1. Reilly, T et al. (2000). *J Sports Sci.*, 18(9): 669-683
2. Korhonen, M. et al.(2003). *Med. Sci. Sports Exerc.*, 35(8): 1419-1428