QUANTIFICATION OF THE IN-SEASON PHYSIOLOGICAL LOADING ON ELITE JUNIOR SOCCER PLAYERS

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Introduction

Training involves a planned and progressive manipulation of physical load. Despite various attempts to examine the training and match load in elite senior soccer players (1), few attempts have been made to analyse the weekly physical load experienced by elite junior soccer players (2). The aim of the present study was therefore to examine the training (T) and match (M) loads experienced by elite junior soccer players during the in-season training period.

Methods

Ten U12 (stature 1.52 ± 0.10 m, body mass 40.7 ± 9.0 kg, Maturity Offset (MO) = -2.19 ± 0.41 yrs), ten U14 (1.67 ± 0.09m, 56.7 ± 10.1kg, MO = -0.30 ± 0.76 yrs) and ten U16 (1.76 ± 0.05m, 68.1 ± 3kg, MO = 1.83 ± 0.43 yrs) elite soccer players were monitored over a two week period during the first month of a competitive season. This time period included one competitive match per week. Physiological loading of training sessions and match-play were monitored using heart rate (HR) and ratings of perceived exertion (RPE). Arbitrary training (TL) and match loads (ML) were calculated by multiplying session RPE and duration (3).

Results

Average HR (T, 151 ± 4 beat/min; M, 183 ± 3 beat/min) and percentage time spent in 80-100% HRmax zones (T, 10 ± 4%; M, 40 ± 6%) were different between T and M in U12 players ($p < 0.05$). A higher percentage of time was also spent in 80-100% HRmax zones in M (30 ± 17%) relative to T (11 ± 5 %) ($p < 0.05$) for U16. In contrast, however, average HR (T, 163 ± 14 beats·min^{-1}; M, 172 ± 6 beats·min^{-1}) was similar between T and M in U16. Average weekly load (total) was significantly greater for training compared to match-play in all groups ($p < 0.01$). Average HR ($p = 0.09$) and the percentage time spent in 80-100% HRmax zones ($p = 0.57$) during T was similar across age groups. Average TL across the two weeks was higher in U12 (1310 ± 143 AU) and U16 (1280 ± 132 AU) relative to U14 (1042 ± 160 AU; $p < 0.001$). During M, average HR was significantly higher in U12 (183 ± 3 beats·min^{-1}) relative to U14 (167 ± 10 beats·min^{-1}) and U16 (172 ± 6 beats·min^{-1}; $p < 0.01$). The percentage time spent in 80-100% HRmax zones during match-play was only significantly different between U12 relative to U14 (21 ± 10%; $p < 0.01$). Average ML across the two weeks was higher in U16 (656 ± 28 AU) relative to U14 (564 ± 51 AU) and U12 (560 ± 128 AU; $p < 0.001$).

Conclusions

These findings demonstrate that elite junior soccer players may experience different physical loads during match-play relative to training. The physical load also varies between age groups in both training and match-play.

References

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