Physiological, hormonal, and match analysis aspects of futsal matches

Pagano Rita1, Tessitore Antonio1,2, Benvenuti Cinzia1, Meeusen Romain2, and Capranica Laura1

1Department of Human Movement and Sport Science, IUSM, Rome, Italy
2Vrije Universiteit, Brussel, Belgium

Introduction
Scarce data are available regarding futsal performances. Thus, the aim of the present study was to provide information on physiological, hormonal and match analysis aspects of futsal matches.

Methods
Ten futsal players (age 23 ± 2 yrs.; height 176 ± 4.7 cm; body mass 73 ± 7 kg; percentage of body fat 7.3 ± 3%) participated in this study. The experimental design consisted of four friendly matches (two 30-minute halves, with a 10-minute rest period), with a three-day rest in between. Heart rates (HR) and blood lactate concentrations (La) were used to evaluate the intensity of the matches. Subject's HR was continuously recorded (Polar S810; sampling = 5 s) and expressed as percentages of subject’s maximum heart rate (%HRmax). La was measured (Accutrend Lactate Analyser, Roche, Basel, Switzerland) after the warm-up, first half, and second half of the match. The players were filmed during the match and videotapes were analyzed (VHS "JVC BR 8600") to evaluate the following motor activity parameters: 1) running; 2) walking; 3) inactivity; and 4) positioning. For each category the frequency of occurrence was calculated with a class interval width of 5 s. For cortisol measurements, salivary samples were collected at 8:00am, 12:00am (after the match), 17:00pm, and 8:00am the morning after the match. To avoid the exercise-induced dehydration, participants were encouraged to drink water before, during and after the match in order to meet their re-hydration needs. The athletes’ water intake was registered until the afternoon tests.

Results
No significant difference was found for the percentages of occurrence of %HRmax during the two halves of the futsal matches (Fig. 1) and for La values (warm up: 2.0 ± 0.5 mM; first half: 4.4 ± 2.4 mM; second half: 3.8 ± 2.0 mM). Cortisol values (baseline values: 8:00am = 8.3 ± 2.5 ng/ml; 12:00am = 7.5 ± 2.1 ng/ml; and 17:00pm = 4.8 ± 1.0 ng/ml) were 8.2 ± 2.5 ng/ml, 8.0 ± 2.4 ng/ml, 6.2 ± 1.1 ng/ml and 9.8 ± 2.3 ng/ml for the 8:00am, 12:00am, 17:00pm, and 8:00am after the match, respectively. Figure 2 shows the frequency of occurrence for the motor activities of the futsal players. Most of the actions lasted less than 10s. After the match the players’ weight was significantly (p<0.001) lower (72.3 ± 6.9 kg) than before the match (73.0 ± 6.9 kg). However, the overall water intake (2.9 ± 0.8l) till the afternoon nullified this difference.

Discussion/Conclusion
To the large amount of information about soccer corresponds a very poor literature about futsal. This study provides information about the futsal players’ performance in order to optimize their training. Regarding HR and La values, the lack of differences between the two halves of the match highlights that players maintain high level of efforts throughout the match. Moreover, the match analysis shows that the competition is based mainly upon short actions, independently from their intensity. Consequently, a high anaerobic fitness level is deemed necessary. Intensive physical activity induces an increase in cortisol concentration (Maso, 2004). In this study, the cortisol values of the morning after match were higher than the baseline, showing the necessity of a correct recovery to avoid cumulative fatigue. The ability to produce high rates of power output and to sprint is essential in futsal. Yasumatsu et al. (2003) claimed that water intake during games prevents the decrease of physical rather than technical performance. In the present study, even though a significant weight loss was observed at the end of the game, the players showed an appropriate re-hydration.

References