THE EFFECT OF ENVIRONMENTAL CONDITIONS AND PLAYING SURFACE ON CORE TEMPERATURE OF MALE SOCCER PLAYERS DURING PRESEASON CONDITIONING


Context: Do healthcare professionals need to be concerned about heat illnesses while teams practice on heat deflecting artificial turf more than when they practice on grass? Objective: The purpose of this study was to investigate physiological response (thermoregulation) of male soccer players to pre-season conditioning during practices on turf and on grass. The secondary purpose was to investigate the differences in relative humidity, surface and air temperature between turf and grass fields. Design: Experimental repeated measures design was used collecting data every 15-20 minutes. Settings: Data collection took place during preseason soccer practices on turf and grass. Patients: Twelve male soccer players (age = 20 ± 1.26 year, mass = 78.14 ± 7.72 kg, height = 179.17 ± 1.58 cm) participated in the study. Due to injuries/illnesses only 8 completed the study. Interventions: All subjects participated in 1 soccer practice on grass and 1 practice on artificial turf. Secondary purpose of this study monitoring environmental conditions was accomplished by using digital psychrometer Extech HD550. The relative humidity (RH), air (T_A) and surface (T_S) temperatures were measured simultaneously on grass and turf. Main Outcome Measures: Core temperature (T_C) and heart rate (HR) were recorded during 2 pre-season practices (turf, grass). Participants swallowed CorTemp Sensor and wore Polar HR Chest Belts to monitor the exercise intensity. Heart rate and core temperature were recorded simultaneously 4 times during each practice on 2 separate days. Pairwise t-tests were utilized to identify if T_C and HR were significantly different between practices on grass and turf. Secondary purpose measuring T_A/T_S /HR was accomplished by collecting 9 measurements for each dependent variable. A series of independent t-test were utilized. Results: Pairwise t-test (IV – turf/grass, DV- HR/T_C) identified significant difference between T_C on grass (Mean 38.32, SD 0.40) HR on grass (Mean 122.67, SD 11.55) and T_C on turf (Mean 37.48, SD 0.40) HR on turf (84.21, SD 6.27) p<0.001. A series of independent t-test (IV – turf/grass, DV – T_S/T_A /RH) revealed a significant difference in T_S between grass and turf (p<0.001), T_S grass (Mean 25.60, SD1.56) turf (Mean 56.59, SD 3.18),T_A grass (Mean 20.45, SD 0.68) T_A turf (Mean 20.50, SD 1.07), RH grass (Mean 45.78, SD 3.14), RH turf (Mean 40.05, SD 4.64) were not significantly different. Conclusions: Core temperature was significantly higher during practice on the grass compared to turf (p < 0.001). Limitations include sample size and data collected on 2 days/practices. Further investigation is warranted to assess and/or control the contribution of other environmental conditions, hydration, practice duration, practice intensity, and practice volume. Findings confirm the speculation that turf surface temperature is higher than on grass; however the overall air temperature and humidity was not significantly different between these playing surfaces.

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