TACSM Abstract

The Assessment of Hydration Status and Renal Makers Associated with Acute Kidney Injury in NCAA Division I Female Soccer Players During Preseason Training in South Texas: A Pilot Study

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ABSTRACT

Recent research suggest that recurrent heat-associated dehydration and strenuous physical exertion may be associated with the development of acute and potentially chronic renal dysfunction. Typical South Texas environmental conditions in August, during preseason, on NCAA female college athletes may warrant concerns for promoting acute kidney injury (AKI). **PURPOSE**: The purpose of this study is to investigate hydration status and renal biomarkers in NCAA Division I female soccer athletes in South Texas during the preseason. **METHODS**: (Mean ± SEM; n = 12; age: 19.5 ± 0.9 y; ht: 167.6 ± 6.24 cm; wt: 66.6 ± 10.15 kg). Each subject participated in Pre-and post-body composition measures via DXA (iDXA, Lunar Prodigy), pre-, post-practice, and game weight changes (SECA Model 769); provided 14-urine samples throughout the preseason for hydration via Urine Specific Gravity (USG) and renal function Creatinine (UCr) ELISA analyses. Urine samples were collected prior to preseason (PRE-PS), fitness testing days (FT1, FT2), regular practices (MidW1, MidW2, POST-PS) and exhibition games (PRE-BU, POST-BU,12HR-BU, 24HR-BU, PRE-UT, POST-UT, 12HR-UT, 24HR-UT). Heat index was assessed at each practice session and exhibition match (Kestrel 5000; Kestrel Meters). **RESULTS**: 1-way ANOVA for USG analysis, a difference was found at MidW2 prior to the end of the POST-PS 1.018 ± .001 ($p = .03$; CI: 1.017-1.025) and early fitness testing values (FT1: 1.022 ± 0.005; FT2: 1.022 ± 0.006) and the MidW1 of the pre-season 1.025 ±.001; ($p = .004$; CI: 1.022 - 1.027). The BU game USG pre-measure was lower than post (POST-BU, 12 h and 24 h) < $p = .02$; 1.01 ± .001; CI: 1.008 - 1.016), a difference was found during the UT game pre-measure compared to POST-UT and 12 h post values 1.009 ± .0016 ($p = .0009$; CI: 1.006 - 1.013) and no different than the 24 h POST-UT 1.014 ± .001. 2-way ANOVA ($\bar{x}$ heat index x time) for UCr ($mg \cdot dL^{-1} \cdot LBM^{-1}$), a difference was found between PRE-BU and POST-BU ($p = .001$; CI: .448 - 3.81) and comparing PRE-UT to POST-UT ($p = < .0001$; CI: 2.57 - 6.31) and 12HR-UT ($p = < .0001$; CI: 2.09 - 5.21). **CONCLUSION**: Our current analysis suggests, the subjects were euhydrated prior to the exhibition games and hypohydrated 12-hours post-exhibition game, prior to fitness assessments (FT1, FT2), and regular morning practice (MidW1). UCr increased above normative values post-exhibition games. The increases in UCr may be independent of hydration status and muscle mass as euhydration was maintained post-exhibition matches.