Specific Interventions to Reduce Heat Stress in a Soccer Match: Effect of Cooling

Mehmet S Binnet, MD, TURKEY, Sadi S Kurdak, MD, TURKEY, Kerem Ozgunen, MD, TURKEY
Ron Maughan, MD, UNITED KINGDOM, Susan Shirreffs, PhD, UNITED KINGDOM
Gulfem Ersoz, MD, TURKEY, Jiri Dvorak, SWITZERLAND
Adana, Loughborough, Ankara University, Ankara, TURKEY

No financial conflicts to disclose

FDA Status Cleared

Purpose:

To investigate the effect of cooling intervention on performance and body core temperature in a competitive game.

Methods:

11 soccer players aged 21 ± 2 y (mean ± SD) with V'O2max of 59.8 ± 5.0 ml/kg/min volunteered to play two matches without (NC) and with cooling intervention (CI) for this study. The ambient temperature and humidity were 34.3 ± 0.6 °C and 64 ± 2 % for the first game (NC), and 34.0 ± 0.5 °C and 62 ± 0 % for the second game (CI) respectively. A cooling tent and buckets filled with iced water placed beside the soccer field were used for the cooling intervention. Thermosensor pills were used for body core temperature (Tc) measurements. Match activity was recorded by a global positioning system.

Results:

The highest Tc value was recorded during the last ten minutes of the first half with no significant difference between NC and CI (39.5 ± 0.5 versus 39.3 ± 0.5 C respectively). However pre match and the first measurement of the first half Tc values of CI was significantly lower than NC match. Total liquid consumption was 1473 ± 422 ml for NC, and 1230 ± 494 ml for CI (926 ± 604 ml plain water, and 304 ± 240 ml sports drink). Post-match dehydration % was similar for both NC (2.49 ± 0.67) and CI (2.54 ± 1.21). CI did not change distance covered during the game significantly (8298 ± 589 m versus 8315±549 m for NC and CI groups respectively).

Conclusion:

Even though cooling intervention reduced pre match Tc, cooling intervention was not effective in reducing peak Tc or in improving match performance. The sweating rate, dehydration % and plasma osmolality did not show any difference compare to control match. The Tc values recorded during a competitive soccer match played in extreme heat conditions, it may be necessary to consider some more efficient cooling strategies for soccer players.

This work was funded in part by FIFA/FMARC and the Turkish FA.