

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

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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 \pm SD) with $\dot{V}O_2\text{max}$ 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 (T_c) measurements. Match activity was recorded by a global positioning system.

Results:

The highest T_c 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 T_c 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 T_c , cooling intervention was not effective in reducing peak T_c or in improving match performance. The sweating rate, dehydration % and plasma osmolality did not show any difference compare to control match. The T_c 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.

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