Progressive Dehydration Causes a Progressive Decline in Basketball Skill Performance

Lindsay B. Baker, Kelly A. Dougherty, Mosuk Chow, and W. Larry Kenney


Purpose: To determine the effect of 1, 2, 3, and 4% dehydration (DEH) versus euhydration (EUH) on basketball performance in adult male players. Methods: Seventeen 17- to 28-yr-old male basketball players completed 3 h of interval treadmill walking (40°C and 20% relative humidity) with or without fluid replacement. Subjects completed six trials in random order: 1) EUH with a carbohydrate-electrolyte solution (CES), 2) EUH control (flavored water with 0% carbohydrate and 18 mM sodium), 3) 1% DEH, 4) 2% DEH, 5) 3% DEH, and 6) 4% DEH. After a 70-min recovery period, subjects performed a sequence of continuous basketball drills designed to stimulate a fast-paced game. Measures of overall skill performance during the 80-min game included 1) total time to complete basketball-specific movement drills (sprinting, defensive slides, sprinting-defensive slides combination, and repetitive jumping drills) and 2) total number of shots (foul-line and baseline jump shots, layups, three-point, 15-ft, free throws) made per game. Results: Performance during all timed and shooting drills declined progressively as %DEH increased. Total time to complete basketball-specific movement drills was slower (1%: +7 ± 6; 2%: +20 ± 5 (P < 0.05); 3%: +26 ± 7 (P < 0.005); 4%: +57 ± 9 (P < 0.0001) s), and fewer shots were made during DEH versus EUH control (1%: -5 ± 1; 2%: -6 ± 2 (P < 0.05); 3%: -8 ± 2 (P < 0.005); 4%: -10 ± 1 (P < 0.0001) shots made). There were no significant differences in performance between CES and EUH control. Conclusion: Basketball players experienced a progressive deterioration in performance as DEH progressed from 1 to 4%. The threshold, or % DEH at which the performance decrement reached statistical significance, was 2% for combined timed and shooting drills.