Dehydration Impairs Vigilance-Related Attention in Male Basketball Players

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Purpose: To determine the effects of dehydration (DEH) on attentional vigilance in male basketball players. Methods: The Test of Variables of Attention (TOVA; Universal Attention Disorders) was administered to 11 male basketball players (17-28 yr) at baseline (test1), after walking (50% VO2max) in the heat (40°C and 20% relative humidity) (test 2), and then after a simulated basketball game (test 3). Tests 2 and 3 were performed while subjects were either DEH (1-4%) or euhydrated (EUH). The TOVA consisted of target-infrequent and target-frequent conditions, simulating static and dynamic (such as a basketball game) environments, respectively. TOVA measures included errors of omission (OE) and commission (CE), response time (RT), and sensitivity. Results: During the target-infrequent half of test 3, EUH resulted in significantly better sensitivity (+0.4 ± 1.2 vs. -0.9 ± 1.3), faster RT (-8 ± 20 vs. +16 ± 28), and fewer OE (-0.4 ± 0.7 vs. +1.3 ± 2.4) compared with DEH. During the target-frequent half, EUH resulted in significantly fewer OE (-4 ± 15 vs. +5 ± 7) and CE (-1.9 ± 3.2 vs. 0.6 ± 1.4) in test 2 and greater sensitivity (+0.7 ± 2.6 vs. -0.7 ± 1.1) and faster RT (-21 ± 28 vs. +5 ± 31) than DEH in test 3. Conclusion: Vigilance-related attention of male basketball players was impaired by DEH, especially during the target-frequent condition of the TOVA. These results suggest that fluid replacement is essential to prevent the decline in vigilance that occurs with DEH in highly dynamic environments. Therefore, basketball players should be advised to maintain EUH for optimal concentration and attentional skills during competition.