ABSTRACT FORM

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The impact of match-play tennis on indirect markers of oxidative stress and antioxidant status

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ABSTRACT

Introduction: Research has shown that both heat stress and endurance exercise can result in an increase in oxidative stress; however, there is limited information regarding the impact of the combination on oxidative balance, in particular an exercise bout characterised by high-intensity long-duration intermittent activity such as tennis. The purpose of this study was to determine the impact of changes in oxidative stress and antioxidant status in response to two simulated tennis matches undertaken in cool (≈22° and 70%RH) and hot (≈36° and 35%RH) environments. Methods: Twelve high level (ITF rank 2-3) male tennis players volunteered to participate in the matches (separated by 72 hours), which consisted of 20 minutes of effective play separated into two 10 min segments. Core body temperature, body mass and indirect markers of oxidative stress and antioxidant status were assessed immediately prior to, at the mid-point and after the completion of the matches. Results: Preliminary data analysis showed that there was no significant difference in body mass loss (~0.5 kg) as a result of playing tennis in hot or cool conditions ($P>0.05$); however, hyperthermia was reached with a greater magnitude in the hot (39.97±0.6ºC) versus cool (38.73±0.2ºC) environment. Oxidative stress increased from pre-to post-match in the cool condition ($P<0.05$) and antioxidant status increased in the hot condition from pre-to mid-match and mid-to post-match ($P<0.05$). Conclusions: These results suggest that despite playing tennis in both cool and hot conditions the athletes were able to self-regulate their fluid intake such that there was no change in body mass. Moreover, the initial analysis suggests that the environmental stress observed in the hot condition may provide a necessary signal for the upregulation of antioxidant defence, dampening cellular damage.