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Mild Acute Dehydration Does Not Affect Anaerobic Power Output

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Many sports and physical activities take place in hot environments which can lead to dehydration. Dehydration during aerobic activities has negative physiological effects on substrate usage optimization, skeletal muscle metabolism, cardiovascular responses, thermal regulation, and perceived-exertion; which can negatively affect performance. However, it is currently unclear how dehydration affects anaerobic performance. **PURPOSE:** To examine the effect of moderate dehydration on power output and blood lactate accumulation during anaerobic exercise. **METHODS:** Nine recreationally active participants (2 female, 7 male) completed two exercise sessions, well hydrated (HYD) with a urine specific gravity (USG) between 1.000-1.019 and moderately dehydrated (DEH) with a USG > 1.020. Each session consisted of a baseline anthropometric and blood lactate (BLa) measurement followed by a 30-second Wingate test and 3 vertical jumps used to measure peak power. The Wingate test was performed on an electronically braked cycle ergometer. The vertical jump tests were measured using the My Jump 2 App. Additional BLa measurements were taken immediately post-Wingate test and at 5, 10, and 15 minutes post-Wingate test. A paired t-test was used to measure the power differences between each condition. A repeated-measures ANOVA was used to analyze BLa differences. **RESULTS:** There was no statistical difference in peak power during the Wingate test between hydrated and dehydrated trials (1051 ± 315 watts vs. 1036 ± 339 watts, respectively; $p=0.605$). Additionally, no statistical difference was found for peak power during the vertical jump trials between hydrated and dehydrated conditions (1913 ± 619 watts vs. 1950 ± 729 watts, respectively; $p=0.660$). BLa values at baseline, 5, 10, and 15 minutes post-Wingate test for the HYD trial were 1.4 ± 0.2 mmol/l, 8.2 ± 3.9 mmol/l, 8.6 ± 2.5 mmol/l, 8.3 ± 2.6 mmol/l, 6.6 ± 2.2 mmol/l; for the DEH trial they were 1.3 ± 0.6 mmol/l, 7.7 ± 2.2 mmol/l, 7.7 ± 2.6 mmol/l, 7.7 ± 2.3 mmol/l, 6.8 ± 1.9 mmol/l. BLa levels were increased in response to anaerobic exercise ($p>0.05$) but there was no difference between hydration state ($p= 0.451$). **CONCLUSION:** These results indicate that during acute bouts of anaerobic exercise, moderate dehydration does not have a negative effect on power output.