

## The Effect of Morning Thirst on Afternoon Hydration Status

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Category: Masters

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### ABSTRACT

Thirst sensation is an important stimulus for drinking behavior; however, the effect of thirst sensation on later hydration status remains unclear. **PURPOSE:** To investigate the effects of morning thirst on afternoon hydration status. **METHODS:** Twelve men (mean  $\pm$  standard deviation; age:  $21 \pm 2$  years; mass:  $81.0 \pm 15.9$  kg) and twelve women (age:  $22 \pm 3$  years; mass:  $68.8 \pm 15.2$  kg) visited the laboratory in the morning (first morning) and afternoon (2:00-4:00pm) for three consecutive days under a free-living condition. At each visit, participants provided a urine sample where urine indices were analyzed (urine specific gravity [ $U_{SG}$ ], urine color [ $U_{COL}$ ], urine osmolality [ $U_{OSMO}$ ]), and nude body mass was collected to calculate body mass loss (BML). Then, thirst was assessed with a Likert scale, and a blood sample was collected to analyze plasma osmolality ( $P_{OSMO}$ ), hemoglobin, and hematocrit to calculate % plasma volume change (PV). Participants recorded food and fluid intake between the morning and afternoon visits to determine total water intake (TWI). Linear regression was used to predict thirst from the morning on hydration indices in the afternoon. Also, a stepwise linear regression predicted thirst in the afternoon from hydration indices in the morning. Pearson's product moment correlation was used to calculate the relationship between TWI and hydration markers. **RESULTS:** Higher morning thirst significantly predicted lower  $U_{OSMO}$  ( $r^2=0.056$ ,  $p=0.045$ ),  $U_{SG}$  ( $r^2=0.096$ ,  $p=0.008$ ),  $U_{COL}$  ( $r^2=0.074$ ,  $p=0.021$ ), and higher thirst ( $r^2=0.074$ ,  $p=0.021$ ) in the afternoon. However, thirst in the morning did not predict BML, PV,  $P_{OSMO}$ , and TWI in the afternoon ( $p>0.05$ ). Increased thirst and BML in the morning together significantly predicted higher thirst ( $r^2=0.125$ ,  $p=0.010$ ) in the afternoon. Increased TWI was associated with lower  $U_{COL}$  ( $r=0.336$ ,  $p=0.004$ ) and BML ( $r=0.297$ ,  $p=0.011$ ) in the afternoon. However, TWI was not associated with any variables in the morning or the remaining variables in the afternoon, including  $U_{SG}$  and  $U_{OSMO}$  ( $p>0.05$ ). **CONCLUSION:** Increased morning thirst impacts afternoon urine indices and thirst. However, morning thirst does not influence TWI between the morning and the afternoon, and TWI is not associated with morning hydration status. Therefore, afternoon hydration status might be impacted by morning thirst, although individuals might not consume fluid based on their morning thirst or hydration status.