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## Presentation Abstract

Session: D-28-Fluid Intake and Hydration Assessment

Thursday, May 29, 2014, 1:00 PM - 6:00 PM

Presentation: 1809 - **Thirst Perception Tracks Progressive Dehydration During Exercise In The Heat**

Location: WB1, Poster Board: 95

Pres. Time: Thursday, May 29, 2014, 3:30 PM - 5:00 PM

Category: 0801. Environmental and Occupational Physiology - heat stress and fluid balance

Keywords: net fluid balance; thirst; dehydration

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Abstract: **Thirst perception tracks progressive dehydration during exercise in the heat**

Thirst is claimed to be a perfect measure of fluid needs, but insufficient information is available on the association between thirst perception and actual dehydration.

**Purpose:** to assess the strength of the actual association between net fluid balance (NFB) and thirst during exercise in the heat.

**Methods:** Fourteen healthy participants ( $27.3 \pm 2.3$  years old,  $72.55 \pm 18.52$  kg; mean  $\pm$  standard deviation) reported to the laboratory after an overnight fast and completed two different sessions (dry heat and humid heat), equivalent in WBGT ( $27.7^\circ\text{C}$ ), one week apart. Participants exercised for 2 hours on a stationary bicycle in a climate-controlled chamber without any fluid intake. Nude and dry BM was measured every 30 minutes; dehydration was calculated from weight loss as %BM. At the same time points, thirst perception (TP) was evaluated with Engell's 9-point scale. Means were compared via one- or two-way ANOVAs as pertinent. A multiple regression analysis was used to test the association between NFB and TP, with individuals included in the model.

**Results:** initial values were consistent between sessions (BM:  $72.5 \pm 18.52$  vs  $72.26 \pm 18.32$   $p = 0.185$ ; USG:  $1.017 \pm 0.005$  vs  $1.017 \pm 0.005$ ,  $p = 0.77$ , and thirst:  $2.6 \pm 1.9$  vs  $2.4 \pm 1.33$ ,  $p = 0.39$ ). Neither TP ( $p = 0.916$ ) nor NFB ( $p = 0.140$ ) were different between sessions, but both changed significantly over time ( $p < 0.001$ ), see table. There was a clear association between thirst

and net fluid balance during dehydration:  $R^2 = 0.74$ ,  $R_a^2 = 0.70$ ;  $p < 0.001$ .

| Variable        | Dry Heat (33.8±0.32°C/ 53.1± 3.64% r.h) |                 |                 |                 |                 |              |                 |                 |                 |                 |
|-----------------|---|-----------------|-----------------|-----------------|-----------------|--------------|-----------------|-----------------|-----------------|-----------------|
| Time            | Pre Exer                                | 30 min          | 60 min          | 90 min          | 120 min         | Pre Exer     | 30 min          | 60 min          | 90 min          | 120 min         |
| NFB (kg)        | 0.00<br>(0)                             | -0.42<br>(0.22) | -1.07<br>(0.43) | -1.68<br>(0.61) | -2.23<br>(0.78) | 0.00<br>(0)  | -0.37<br>(0.18) | -0.99<br>(0.39) | -1.57<br>(0.54) | -2.19<br>(0.85) |
| TP (a.u)        | 2.6<br>(1.9)                            | 3.6<br>(2.1)    | 4.6<br>(2.1)    | 5.9<br>(1.7)    | 7.4<br>(1.4)    | 2.4<br>(1.3) | 3.6<br>(1.9)    | 5.1<br>(1.6)    | 5.7<br>(2.1)    | 7.0<br>(1.6)    |
| Dehydration (%) | 0.00<br>(0)                             | -0.55<br>(0.20) | -1.44<br>(0.31) | -2.28<br>(0.36) | -3.03<br>(0.46) | 0.00<br>(0)  | -0.52<br>(0.22) | -1.36<br>(0.36) | -2.16<br>(0.42) | -2.99<br>(0.63) |

Mean (SD)

**Conclusion:** When our subjects were not allowed to drink, progressive dehydration had a strong association with thirst perception.

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Disclosures: **C. Capitan:** None.