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Effects of Oral Saline Consumption on Heart Rate Variability Measurements During Postural Change

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Acute large doses of sodium increase serum sodium levels, which may increase sympathetic activity. Conversely, the increase in plasma volume due to volume loading may suppress sympathetic drive and increase parasympathetic activity. Changing from supine to upright posture requires shifts in autonomic activity to combat against the blood pooling effects of gravity. Saline administration has been shown to be effective in combatting symptoms in subjects with orthostatic intolerance. However, it is unclear what saline administration will do in normal healthy subjects. **PURPOSE:** To examine the effect of oral saline consumption on autonomic function in healthy adults in the supine and upright seated postures. **METHODS:** Healthy subjects participated in two randomized data collection visits. During the experimental visit participants orally consumed 423mL of normal saline (NS) and waited 90min before data was recorded. During the control visit (CON) no saline was consumed. Beat-by-beat blood pressure and an electrocardiogram were recorded during 5 minutes of supine (SUP) rest followed by 5 minutes of upright sitting (SIT). Heart rate variability was analyzed to assess resting autonomic function between conditions and postures using a repeated measures two-way ANOVA. **RESULTS:** Sixteen healthy participants (age 21.1 ± 1.0 years; body mass index 25.0 ± 1 kg/m^2,) were studied. Main effects showed that heart rate (HR) decreased slightly ($p < 0.05$) during the saline condition (CON: 65.8 ± 7.96 bpm, NS: 64.24 ± 8.55 bpm). There was a significant interaction effect for low frequency power (LF), high frequency power (HF). Post hoc tests provided evidence that LF was increased in the SUP compared to SIT in both the control (SUP: 33.24 ± 17.78 nu, SIT: 50.04 ± 22.60 nu) and NS (SUP: 40.70 ± 21.62 nu, SIT: 55.0 ± 23.67 nu), while HF decreased in the control (SUP: 64.24 ± 17.10 nu, SIT: 48.95 ± 22.20) and NS (SUP: 57.69 ± 20.82 nu, SIT: 44.27 ± 23.17. **CONCLUSION:** The results of this study suggest that heart rate was suppressed by saline consumption. However, this preliminary data suggest that there is no evidence that saline consumption had an effect on heart rate variability during either SUP to SIT postures.