



EFFECTS OF BASELINE SERUM OXYTOCIN AND SUBCUTANEOUS OXYTOCIN INJECTION ON LOCAL HUMAN PAIN AND TOUCH PERCEPTION

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BACKGROUND

The neuropeptide oxytocin (OT) can reduce pain and may mediate pleasant effects of gentle touch^{1,2,3}. While centrally administered OT can reduce pain, the local, peripheral effects of OT on experimental pain and touch have not been studied.

Here we test the local effects of subcutaneous injection of OT in humans on gentle brushing and experimental pain, hypothesizing reductions in pain and increases in brushing pleasantness.

In addition, previous studies have shown associations between blood plasma OT concentrations and lower ratings of chronic pain, as well as higher tolerance of experimental pain⁴. We therefore conducted preliminary investigations into the associations between endogenous OT and gentle touch, as well as experimental pain stimuli.

TASKS

Light touch- Two rounds of gentle brushing were administered by an experimenter across 6cm of skin overlapping the injection site at 3 and 30 cm/s for 15s in a random order.

Pinprick- Von Frey filaments were administered within 0.5cm of injection to measure mechanical pain threshold (MPT) and temporal summation (TS).

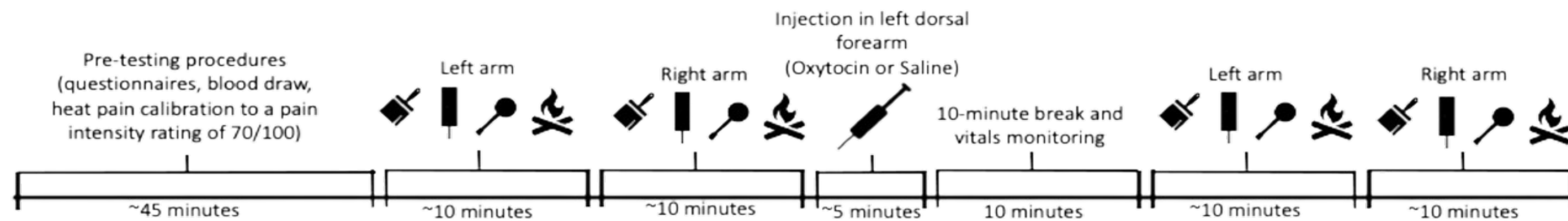
Pressure Pain- Pressure pain threshold (PPT) was measured via a pressure algometer (round 1cm diameter tip) that was applied with ascending force over the area of injection until pain was reported.

Heat Pain- Painful heat was delivered via a QST.lab T09 thermode. Heat pain threshold (HPT) was obtained by increasing temperature at 2 °C/s until the participant reported pain.

Heat pain ratings were collected by applying the participant's calibrated pain-70 temperature for 10s; the participant rated unpleasantness and intensity on VAS scales.

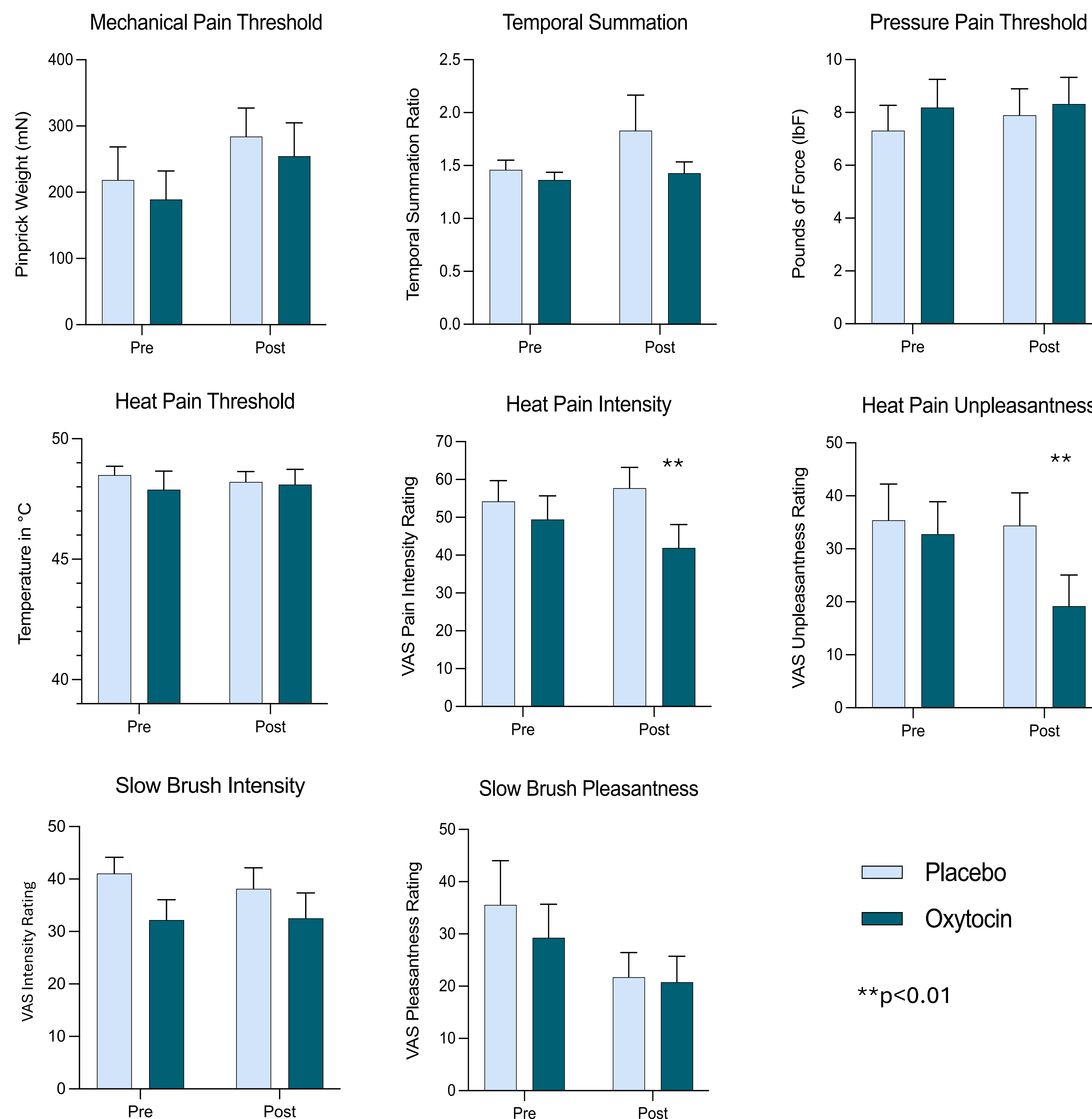
METHODS

Eighteen healthy adults (mean age = 28.2; 13 female) completed a 2-session crossover study



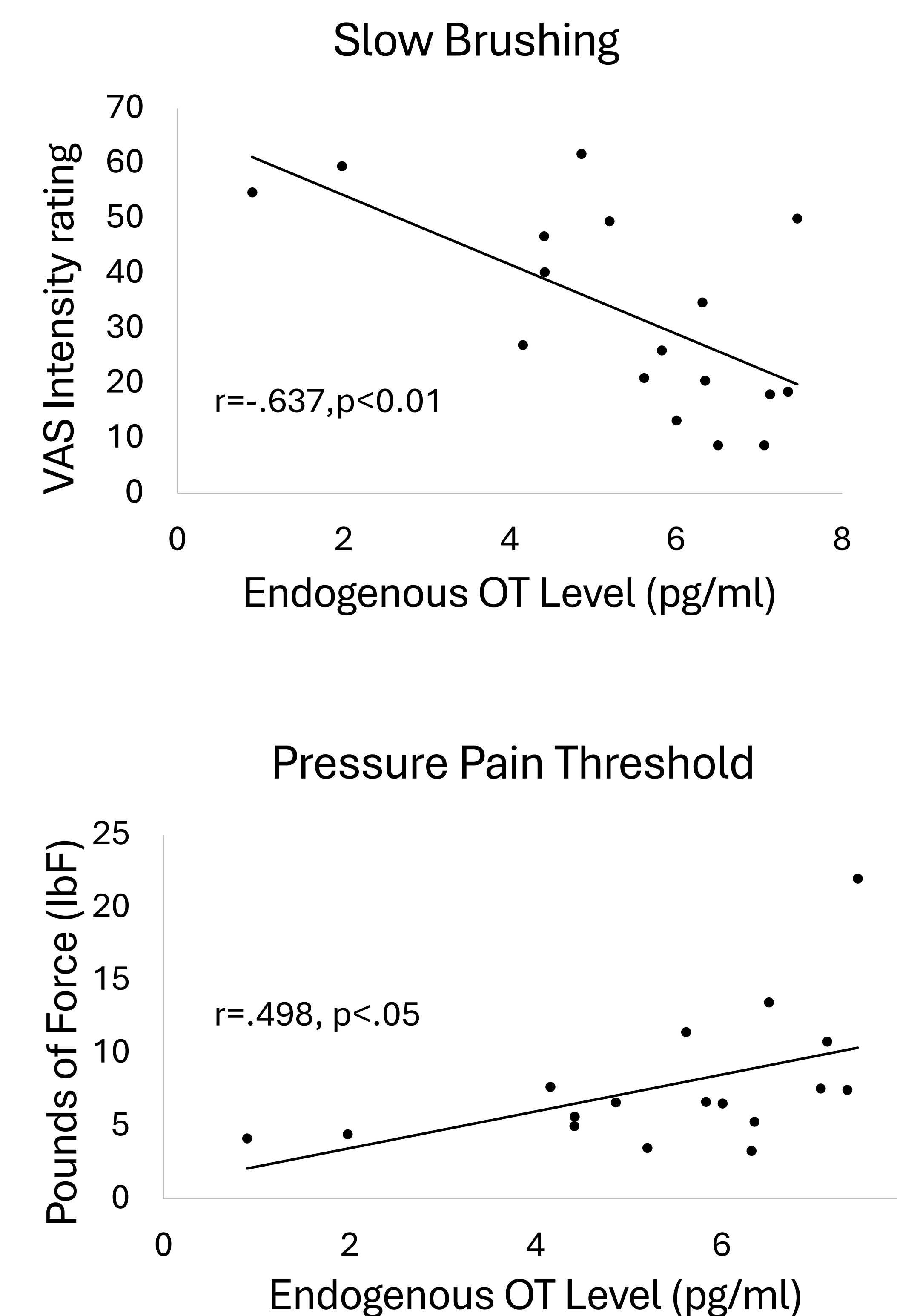
RESULTS: SUBCUTANEOUS OT

Subcutaneous OT did not alter MPT, TS, PPT, or HPT ($p > 0.05$). However, OT significantly reduced ratings of heat pain intensity and unpleasantness ($p < 0.01$).



RESULTS: SERUM OT

Exploratory analysis found a significant negative correlation at baseline between endogenous serum OT level and slow and fast brushing intensity and a significant positive correlation between endogenous serum OT level and PPT. No significant correlations were found for brushing pleasantness, MPT, or HPT measures.



CONCLUSIONS

These findings confirm the ability of OT in or near the skin to modulate acute heat pain perception in healthy adults, opening many exciting possibilities for clinical research.

Furthermore, our results shed light on the complex relationship between endogenous OT and sensory perception, providing valuable insight into the multifaceted role of OT in modulating tactile and pain experience.

Further investigation is needed to fully understand its mechanisms and therapeutic potential.

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