DOES STRESS ALWAYS AFFECT PAIN PROCESSING? DIFFERENCES BETWEEN SPINAL AND TRIGEMINAL SYSTEMS

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INTRODUCTION: The response to stress is a physiologic response necessary for survival. Acute stress is most commonly associated to analgesia though most frequently chronic stress has been associated to hyperalgesia (Suarez-Roca et al., 2014). In the clinic chronic stress has been well documented and linked to pain somatization disorders, such as fibromyalgia, chronic fatigue syndrome, chronic pelvic pain, and temporomandibular disorder (Hannibal and Bishop, 2014).
Many differences have been found between trigeminal and spinal nociception, though up to date there are no comparisons on how stress affects both systems.

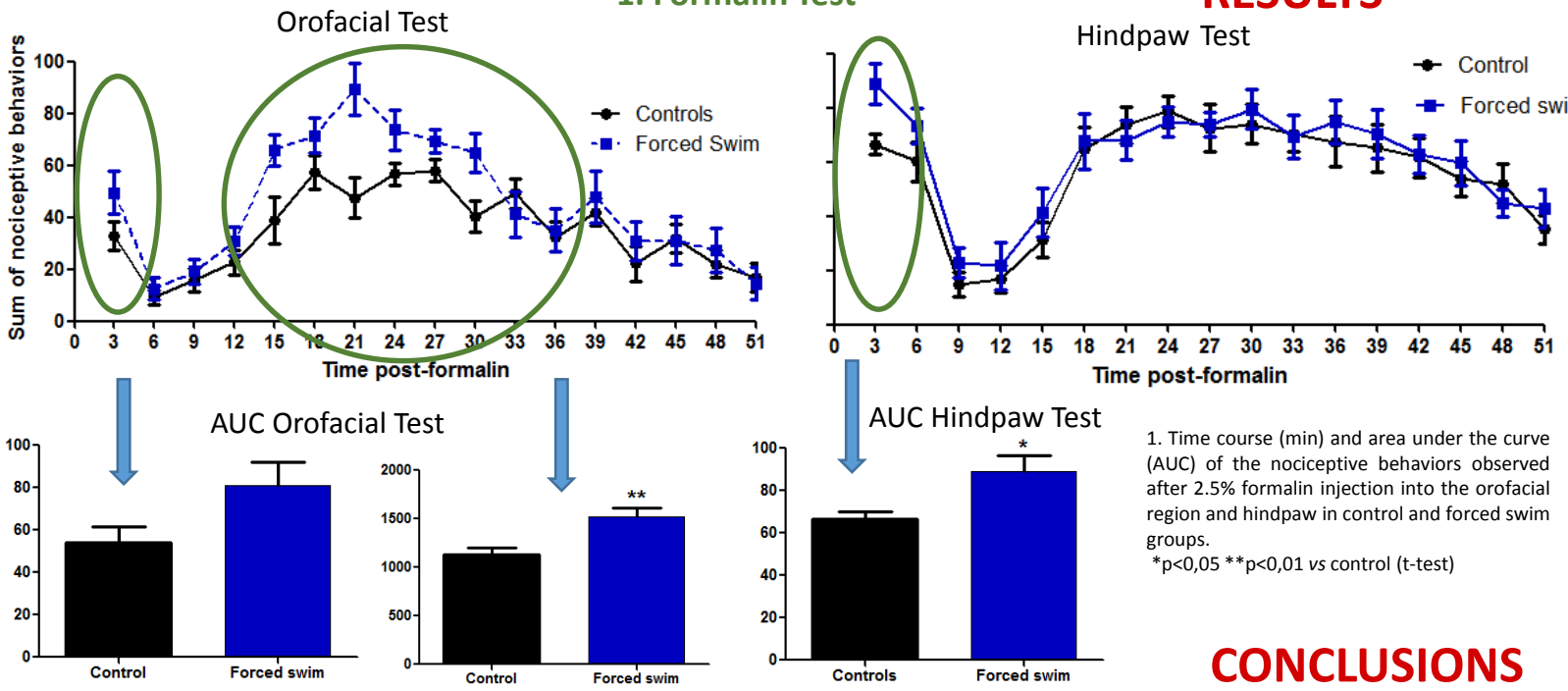
Aim:

To evaluate the effect of chronic stress on nociceptive response to acute and chronic inflammatory nociceptive stimuli in trigeminal and spinally innervated structures.

Methods: Male rats were subjected to forced swim for 3 consecutive days. 24 hours after, behavioral tests were performed:
Formalin test: Formalin injection induces a bi-phasic (acute-inflammatory) nociceptive response. Formalin was injected in the hindpaw or vibrisal pad, nociceptive behaviors were recorded for 51 min.
Hypertonic saline model: muscle HS injection evokes an acute nociceptive response which consists on hindpaw shaking behavior (masseter) or withdrawal of the paw (gastrocnemius).
Elevated plus-maze test: is used to assess anxiety. The time spent on the open/closed arms was determined for 5 min.

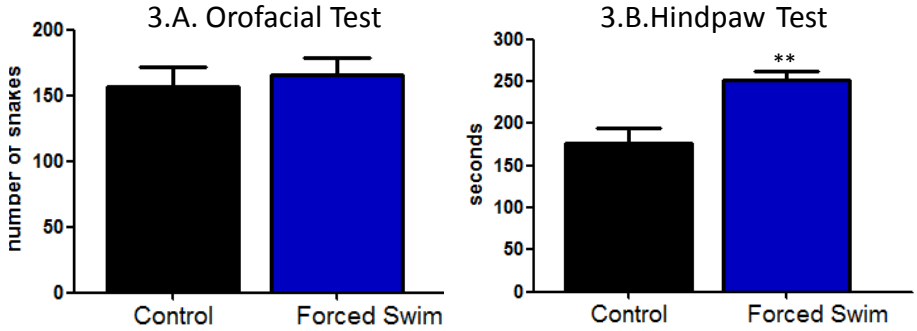
RESULTS

1. Formalin Test



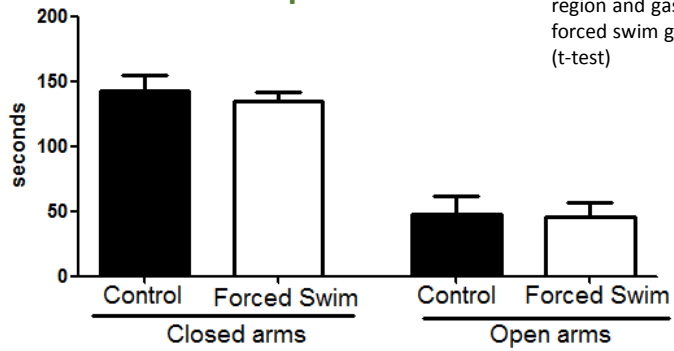
1. Time course (min) and area under the curve (AUC) of the nociceptive behaviors observed after 2.5% formalin injection into the orofacial region and hindpaw in control and forced swim groups.
*p<0,05 **p<0,01 *vs* control (t-test)

2. Hypertonic saline Test



2. Nociceptive behaviors observed after 5% hypertonic saline into the orofacial region and gastrocnemius in control and forced swim groups. **p<0,01 *vs* control (t-test)

3. Elevated plus maze test



3. Time that control and forced swim rats spent in the closed and open arms in the elevated plus-maze test

CONCLUSIONS

✓**Stress affects differently trigeminal and spinal inflammatory nociceptive processing.**

✓ **Differences in pathophysiology of pain could underlie these findings and should be further investigated, as the treatment of pain could differ depending on the affected area.**

BIBLIOGRAPHY:
Hannibal KE, Bishop MD. Phys Ther. 2014 Dec;94(12):1816-25
Suarez-Roca et al., Brain Res Bull. 2014 Jan;100:61-9.

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