

The OMEGA Study: Offset Mechanisms in Evaluation of Lumbar Medial Branch Block Analgesia

Samir Yellapragada¹, BS, BA, Destin Roth¹, BS, Dr. Scott Brancolini¹, MD, Dr. Sean McDermott¹, MD, Dr. Ajay Wasan^{1,2}, MD, Dr. Benedict Alter¹, MD, PhD
University of Pittsburgh 1 Department of Anesthesiology and Perioperative Medicine, 2 Department of Psychiatry

INTRODUCTION

- Lumbar medial branch blocks (MBB) temporarily block nerves that supply the facet joints of the spine and are used to predict response to therapeutic destruction of the nerves¹.
- Even among patients with pain relief following a lumbar MBB, there are many false positives. The reasons for this are unclear.
- Offset analgesia is a sensory phenomenon initially described in lab psychophysical studies. Offset analgesia is defined as exaggerated pain relief following a more intense pain².
- Offset analgesia is thought to relate to pain prediction processing and is likely mediated through descending inhibitory pathways in the central nervous system².
- False positive lumbar MBB may be due to exaggerated pain relief following procedure-related pain, similar to offset analgesia.

METHODS

- This is a mechanistic, prospective, observational study with one main study visit and one follow-up phone call.
- We recruited patients ≥ 18 years who have had daily chronic low back pain for ≥ 3 months. When patients arrived 2 hours early to their scheduled block, they completed surveys regarding their low back pain, a standardized medical interview, and baseline quantitative sensory testing (QST).
- After their scheduled blocks, participants recorded pain intensity on paper at home. At the phone visit the next day, participants verbally reported their recorded pain intensities to researchers.
- A sample of 30 will be powered to detect a moderate correlation between offset analgesia and change in low back pain (pre-post block), calculated with an $\alpha = 0.05$, $\beta = 0.2$ and $r = 0.5$. All data will be analyzed using Stata (v18) and MATLAB.

RESULTS

Figure 1: Lab-based studies of offset analgesia show profound pain decreases after a more intense pain.

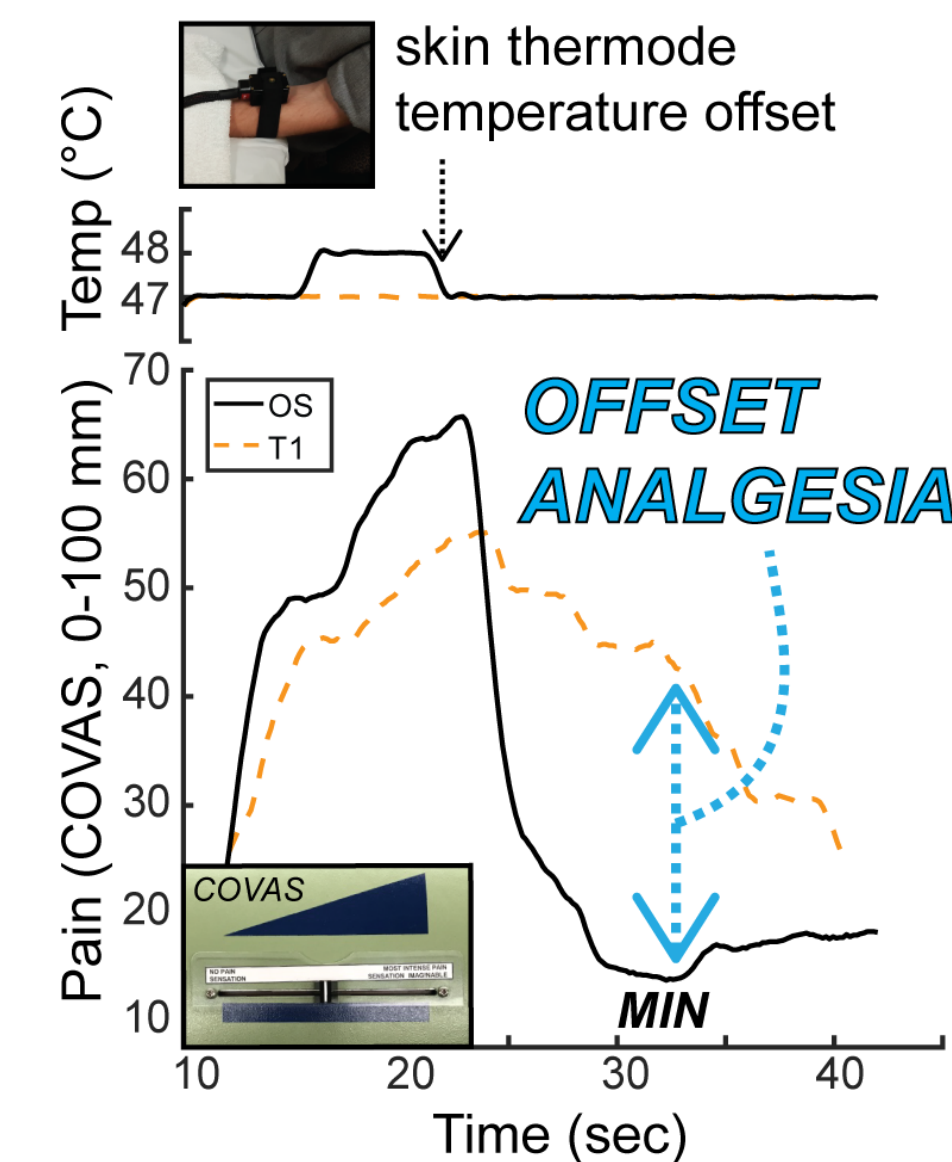


Figure 2: Lumbar medial branch blocks lead to large decreases in chronic low back pain intensity.



Reference 3

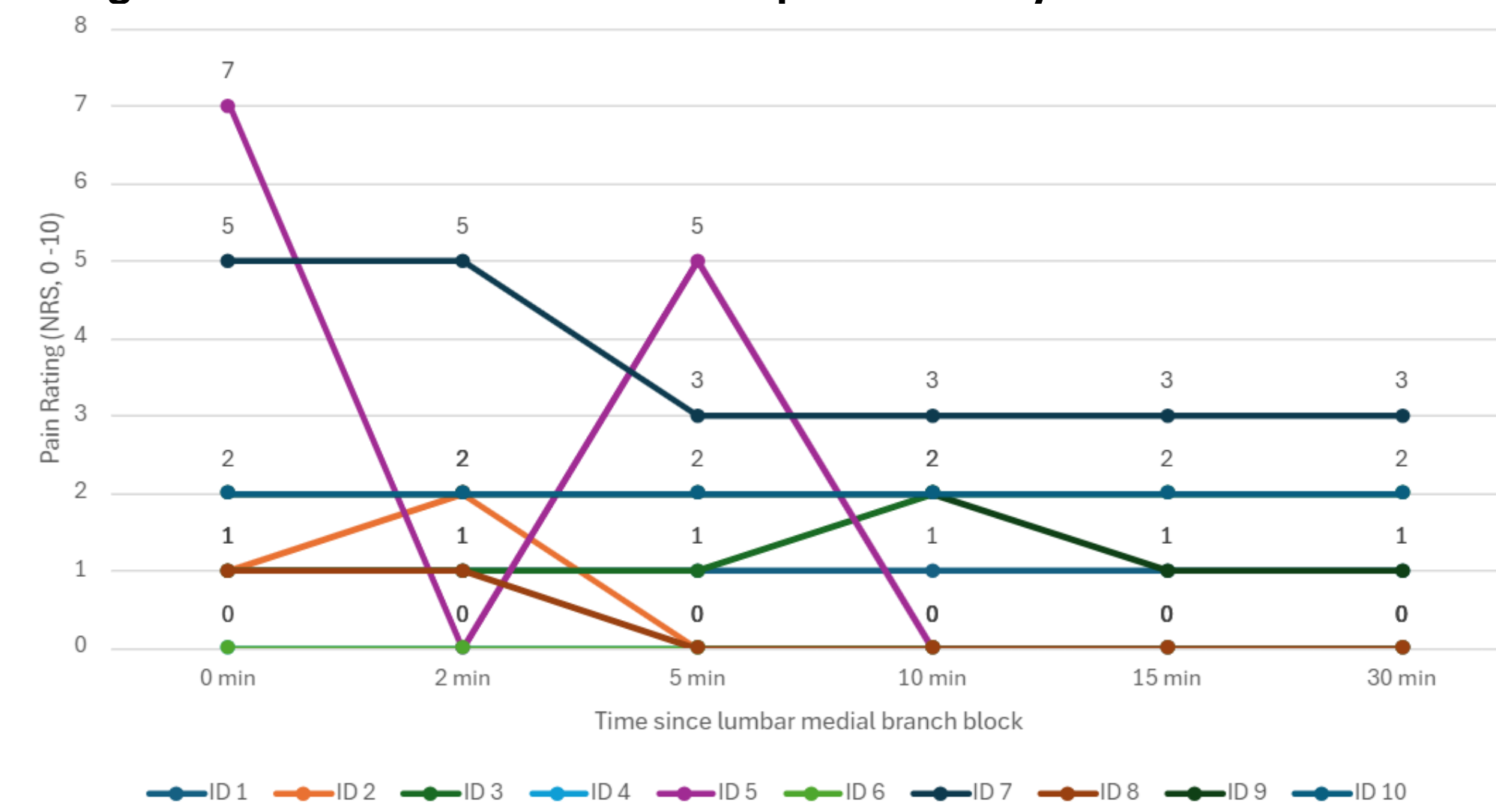


Figure 3: Pain intensity during offset and control stimuli demonstrate the ability to measure offset analgesia and suggest variation in offset analgesia between patients.

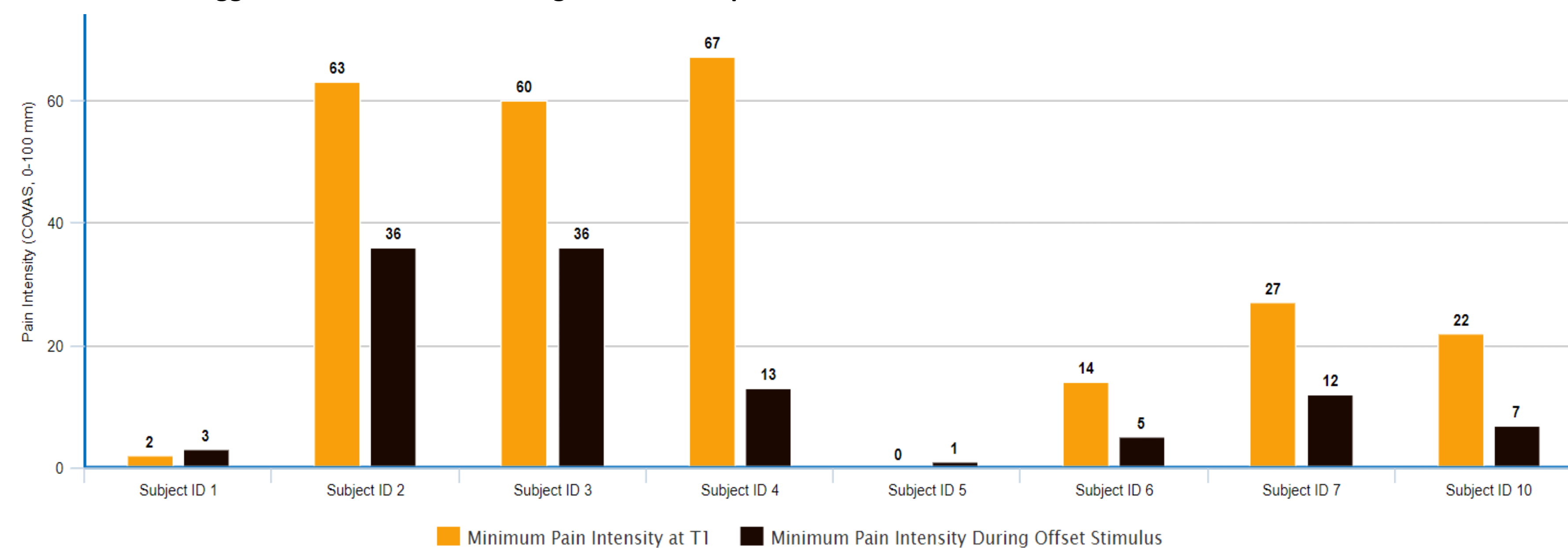
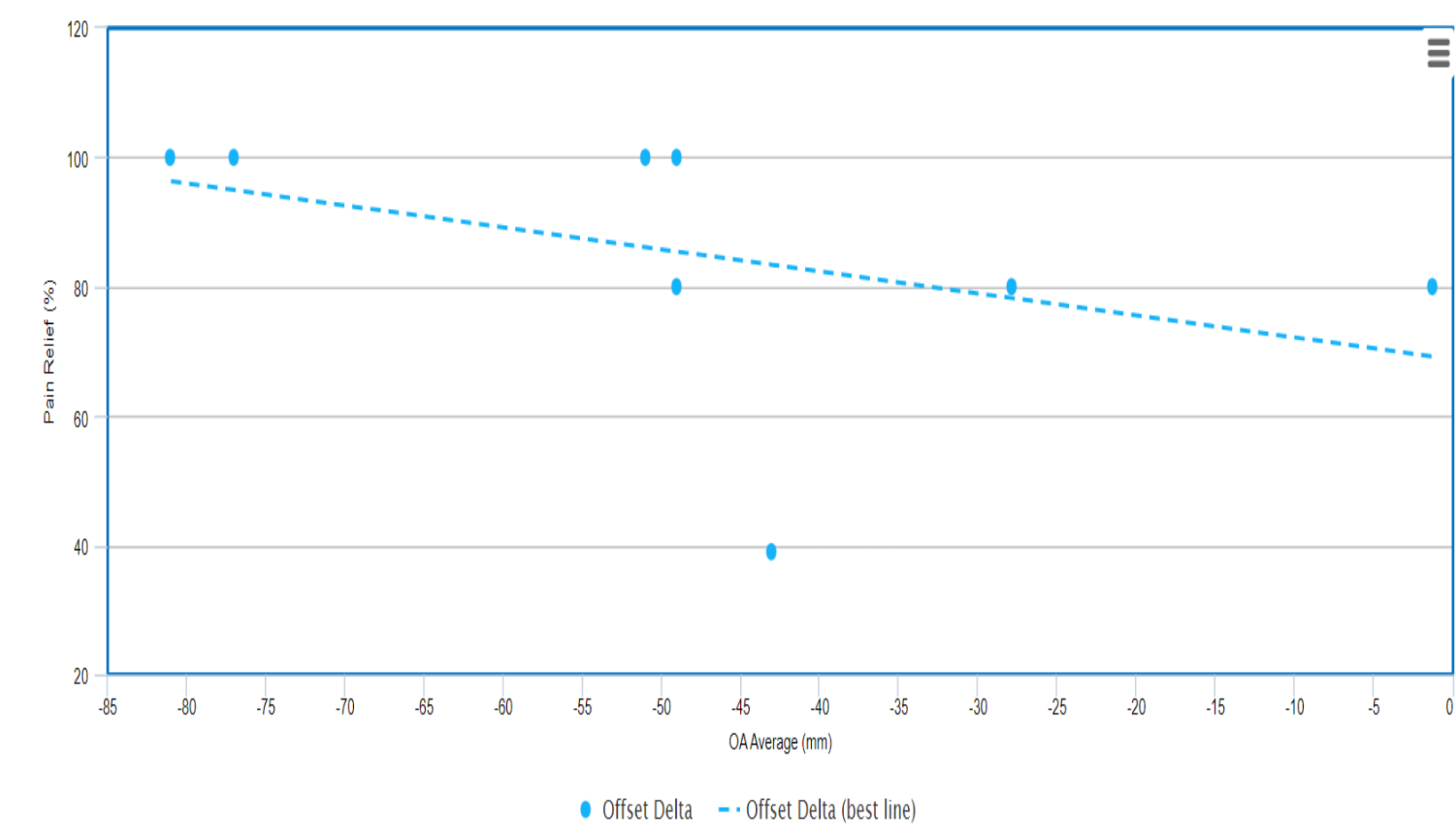


Figure 4: Patient offset delta is significantly correlated with larger degrees of immediate post-block pain relief.



CONCLUSIONS

- Interestingly, our preliminary study on this topic demonstrated a significant correlation between the delta of our OA variable and immediate post-block pain relief.
- Notably, 8 out of 10 participants have reported a maximal pain rating of 2 in mere seconds of administration of the local anesthetic highlighting the importance of this research's aim to differentiate between central mechanisms of pain relief and pharmacologically induced pain relief.

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