

## Introduction

Occipital neuralgia is described as shooting or stabbing pain in the posterior aspect of the scalp, which can be bilateral or unilateral. It is often accompanied by tenderness over the occipital nerve distribution, but it can also manifest as loss of sensation in the affected area. Many different mechanisms have been postulated as the cause of occipital neuralgia, such as nerve root damage, post-surgical damage, irritation, and vascular compression by the occipital artery.

Our previous literature review demonstrated a gap in current literature focusing on the use of ultrasound to directly visualize and measure the dimensions of occipital nerves in the setting of occipital neuralgia. We, therefore, decided to use ultrasound imaging as a conduit to obtaining occipital nerve measurements within this experiment and further expanded our research question to compare nerve size to the subjective pain scale.

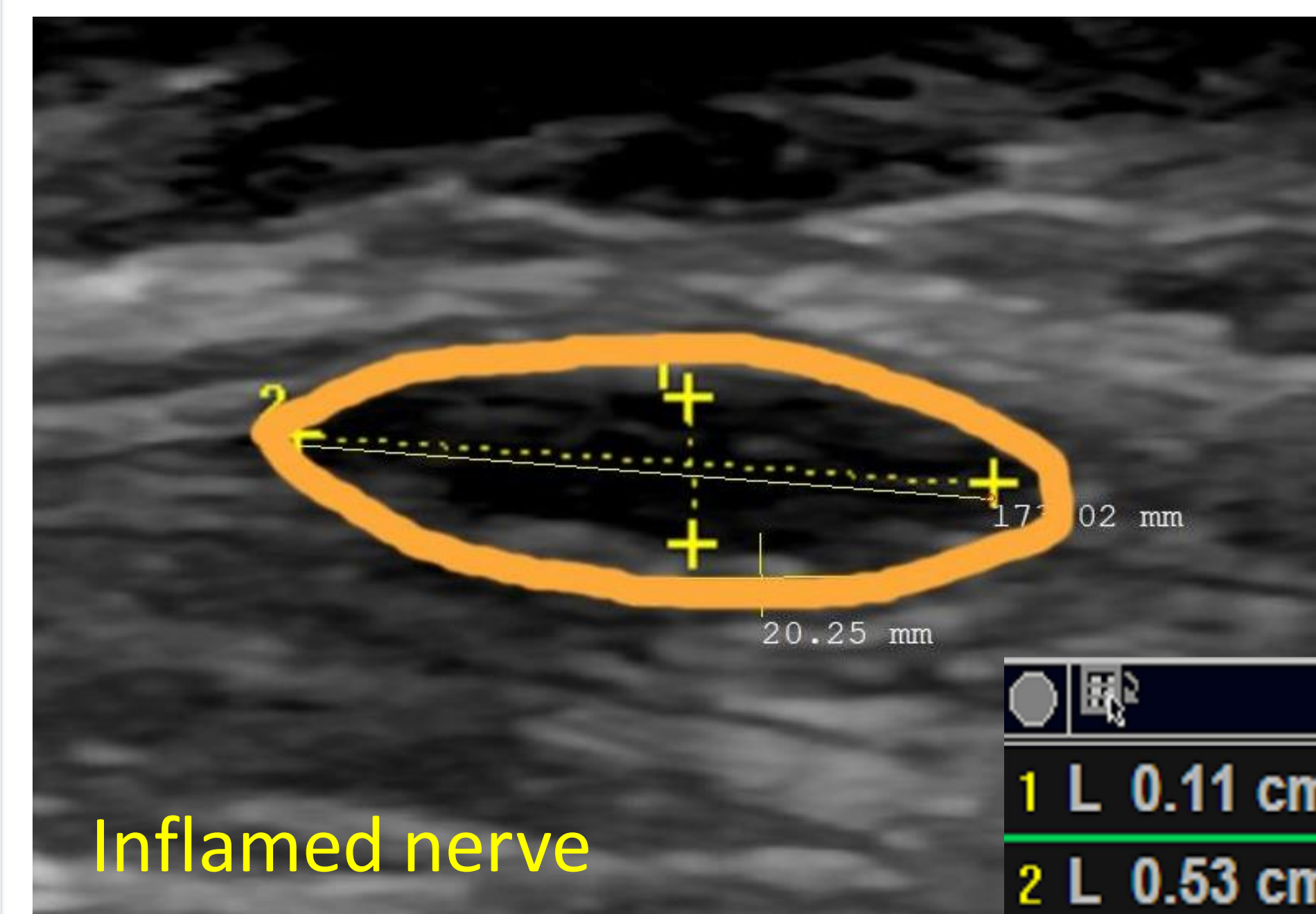
## Design/Method

The objectives of this study were to evaluate the two following hypotheses:

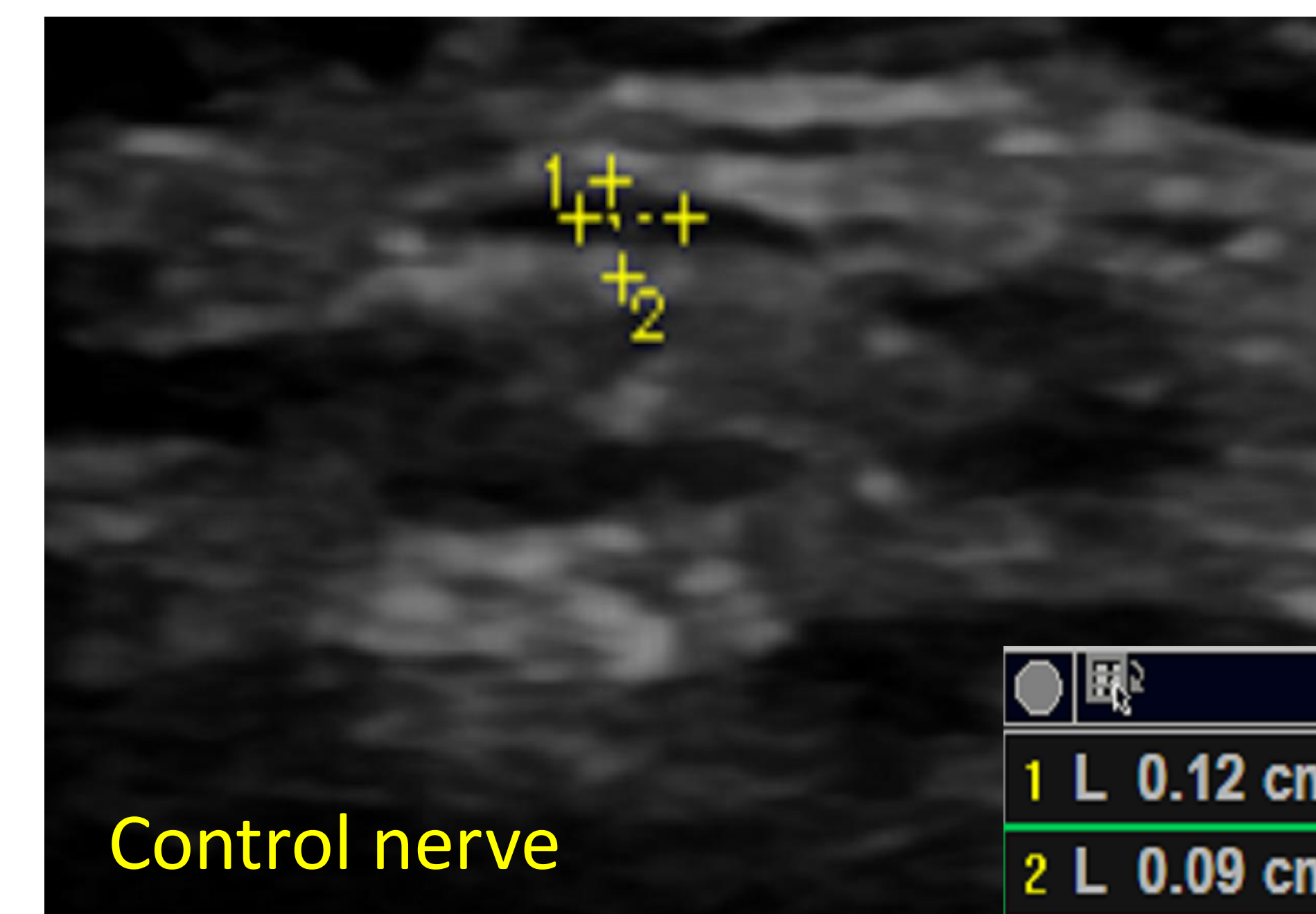
1. Occipital nerve size is more prominent in patients with occipital neuralgia.
2. Occipital nerve size correlates to subjective pain severity in the setting of occipital neuralgia.

A quantitative analysis was done comparing ultrasound-guided measurements of the occipital nerve between 9 patients diagnosed with occipital neuralgia and 13 asymptomatic controls.

## Results



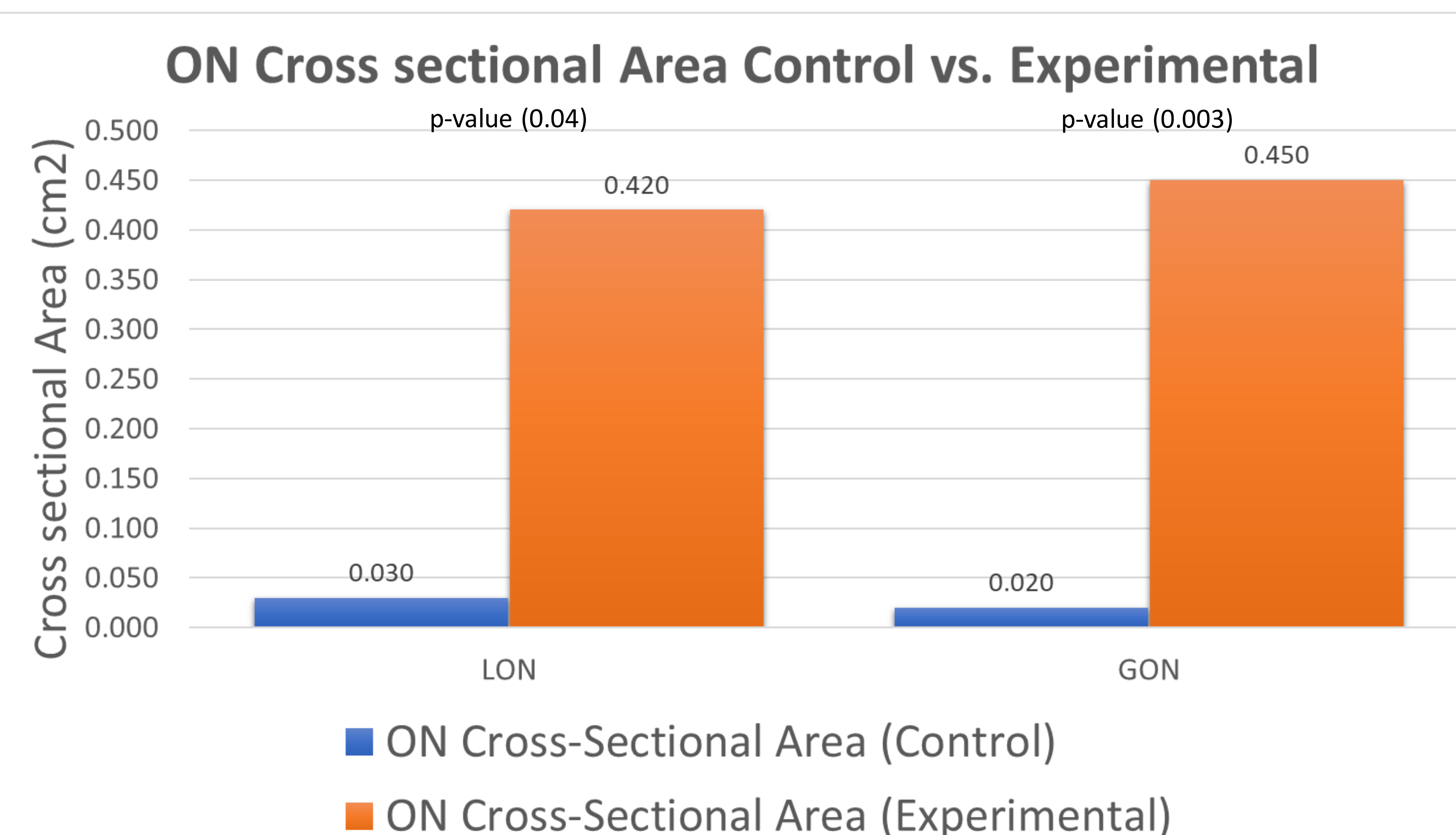
Inflamed nerve



Control nerve

The average lesser occipital nerve (LON) cross-section area in the patient and the control group were measured as 0.42 cm and 0.03 cm, respectively. The patient and control groups' average greater occipital nerve (GON) cross-section area was 0.45 cm and 0.02 cm, respectively. An Independent Samples t-test showed a significant difference between cross-sectional areas of greater and lesser occipital nerves, respectively. (p-value: 0.04, 0.003).

The majority of our patient group had severe pain, and there was no significant difference in their pain score. Therefore, we did not evaluate for correlation between pain score and nerve size.



## Conclusion

Our research provided evidence for increased occipital nerve size in patients suffering from occipital neuralgia. This finding emphasizes the role of ultrasound as an essential diagnostic and surveillance tool for this chronic neurologic condition. However, this study was unable to evaluate the correlation between occipital nerve size and subjective pain scale.

Future studies utilizing expanded data of patients with mild and intermediate pain scale scores could evaluate for correlation.

## References

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