

Efficacy and Tolerability of Intravenous Lidocaine Versus Gabapentinoids in Chronic Neuropathic Pain: A Retrospective Cohort Study

William Kindschuh¹, David Agbato², Dante Mueller¹, Andrew Aboujaoude¹, Melissa Chao¹, Leena Mathew¹
1. Department of Anesthesiology, Division of Pain Medicine, Columbia University, New York, New York, USA.
2. City University of New York School of Medicine, New York, New York, USA.

Introduction

- Neuropathic pain is difficult to manage and is rising in incidence, creating a significant healthcare burden [1]
- First-line medications like gabapentinoids deliver inconsistent analgesia and are often poorly tolerated [1]
- Lidocaine, a sodium channel blocker typically used as a local anesthetic, has shown promise when used intravenously for the treatment of neuropathic pain, but comparisons with the standard of care remain limited [2,3]

Methods

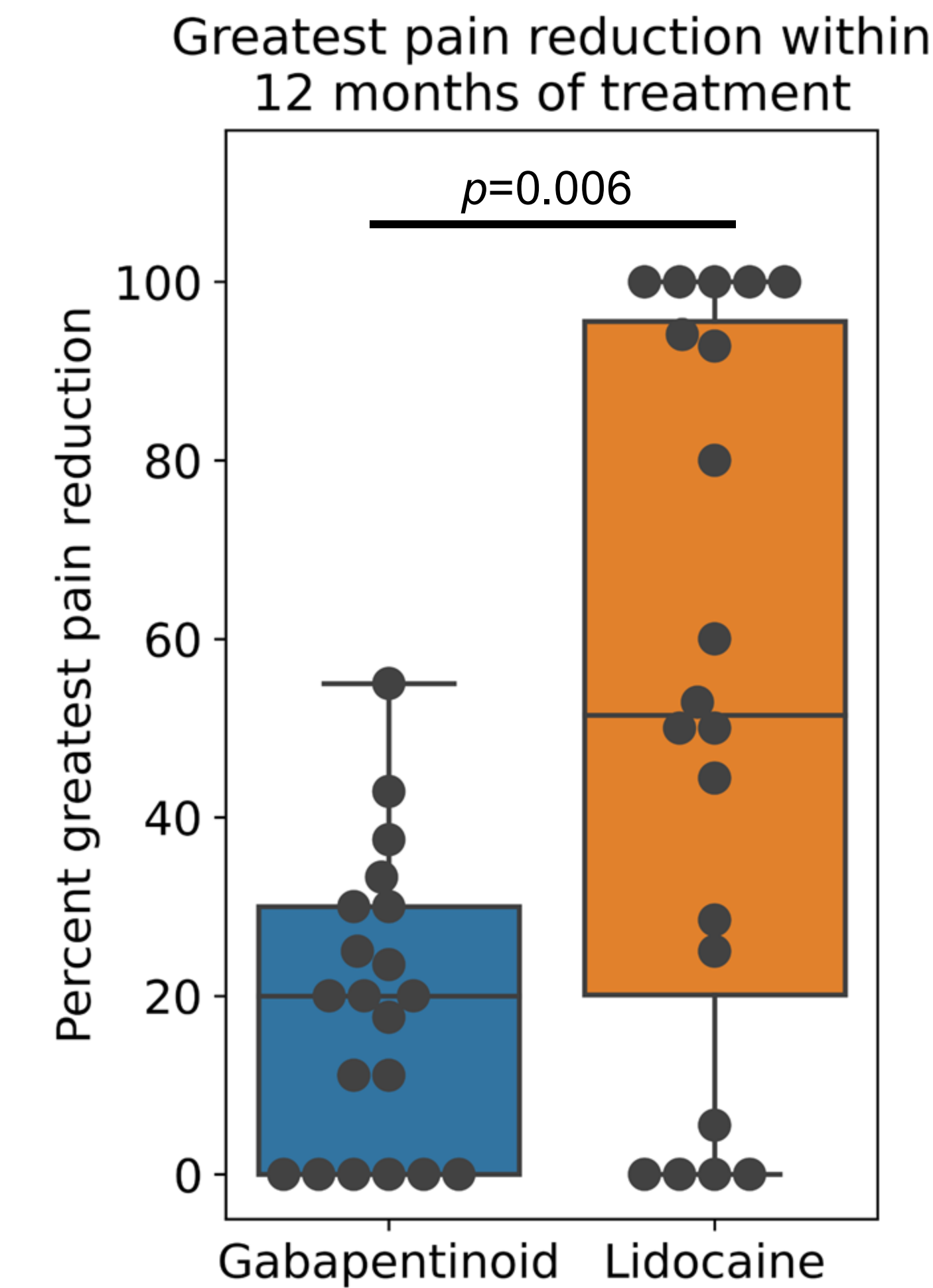
- We conducted a retrospective cohort study of neuropathic pain patients at the Columbia University Pain Clinic between January 1st 2020 and March 1st 2025
- 20 patients who received lidocaine infusions were compared with 20 patients who received gabapentinoids
- Outcomes included:
 - Greatest pain reduction reported within 12 months of beginning treatment
 - Adverse medication effects
- Patients also taking opioids, TCAs, or SNRIs were excluded

Cohort characteristics

	Lidocaine	Gabapentinoid	
Gender	12 Female (60%) 8 Male (40%)	12 Female (60%) 8 Male (40%)	$p = 1$
Race	6 Non-White (30%) 14 White (70%)	11 Non-White (55%) 9 White (45%)	$p = 0.20$
Age (median [range])	52 [21 – 89]	60.5 [29 – 87]	$p = 0.19$

Lidocaine and gabapentinoid groups were similar in gender, race, and age, baseline anxiety, and baseline pain ($p > 0.05$ for all)

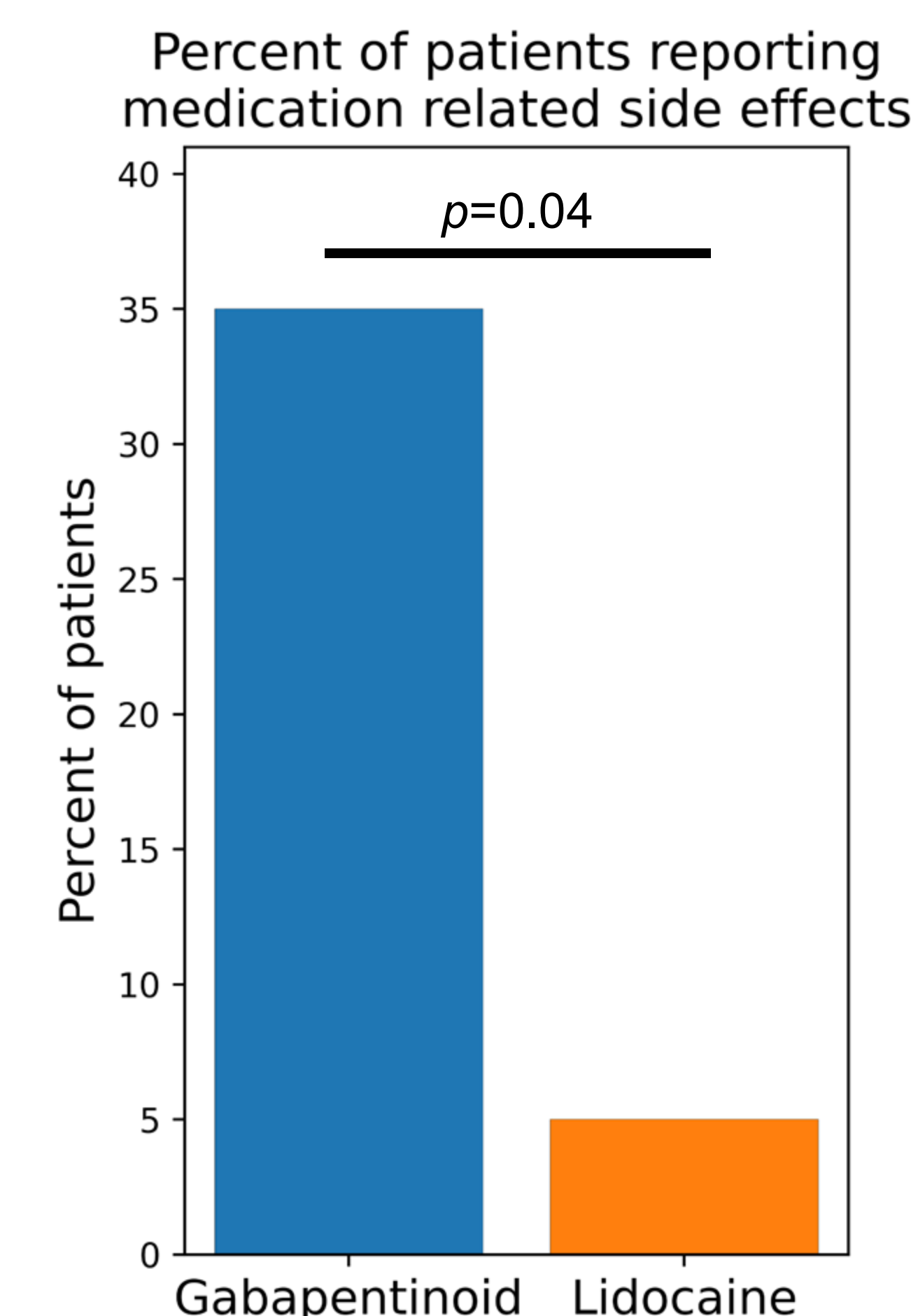
Results



Patients' largest pain reductions were significantly greater in patients receiving lidocaine infusions compared to patients receiving gabapentinoids (54% vs 18%, $p=0.006$)

Patients taking gabapentinoids reported medication-related side effects at a rate significantly higher than patients receiving lidocaine infusions (7/20 vs 1/20, $p=0.04$)

Side effects most frequently reported in the gabapentinoid group included fatigue and dizziness.



Discussion

- Our study demonstrates the potential utility of intravenous lidocaine as an effective chronic neuropathic pain therapy
- We found that patients receiving lidocaine infusions experienced nearly 3-fold greater pain reductions and reported fewer side effects
- The favorable adverse effect profile observed with lidocaine addresses a critical clinical need, as poor tolerability remains a major limitation of first-line therapies. CNS-related side effects of gabapentinoids were not observed in lidocaine infusion patients
- Our results align with those of recent studies suggesting lidocaine provides analgesia through peripheral sodium channel blockade and central modulation of neurotransmitter activity [4]

Limitations

Our investigation has the following limitations:

- The retrospective nature of our study
- The small size of our population and the lack of multiple clinical sites
- The exclusion of patients taking opioids, TCA's, and SNRIs

Future directions

Our investigation motivates additional work in the following areas:

- Larger, prospective studies comparing lidocaine infusions to all standard of care treatment for neuropathic pain
- Mechanistic studies to elucidate the exact mechanisms by which intravenous lidocaine treats chronic neuropathic pain
- Studies comparing lidocaine infusion protocols

References

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- [2] Tremont-Lukats, I.W., et al. (2006). A randomized, double-masked, placebo controlled pilot trial of extended IV lidocaine infusion for relief of ongoing neuropathic pain. The Clinical Journal of Pain, 22(3), 266–271.
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- [4] Yang, X., et al. (2020). A review of the mechanism of the central analgesic effect of lidocaine. Medicine, 99(17), e19898.