A Retrospective Comparison of Intravenous Lidocaine to Standard of Care Oral Analgesics for the Treatment of Chronic Neuropathic Pain

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Introduction

- Neuropathic pain is difficult to manage and is rising in incidence, creating a significant healthcare burden [1]
- First-line medications like gabapentinoids, TCAs, and SNRIs deliver inconsistent analgesia and are often poorly tolerated [1]
- Opioids have also been used to treat neuropathic pain but have adverse side effects and abuse potential [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

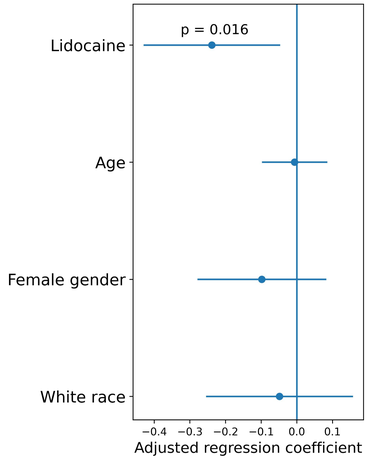
- We conducted a retrospective cohort study of neuropathic pain patients at the Columbia University Pain Clinic between January 1st 2020 and March 1st 2025
- 26 patients who received lidocaine infusions were compared with 36 patients who did not receive lidocaine infusions and who received gabapentinoids, TCAs, SNRIs , or opioids
- Outcomes included: 1) Greatest pain reduction reported within 12 months of beginning treatment and 2) Adverse medication effects

Cohort characteristics

	Lidocaine	Standard of Care	
Gender	16 Female (62%) 10 Male (38%)	26 Female (72%) 10 Male (28%)	$p = 0.42$
Race	2 Asian (8%) 3 Black (12%) 6 Hispanic (23%) 11 White (42%) 1 Other (4%)	0 Asian 10 Black (28%) 12 Hispanic (33%) 4 White (11%) 4 Other (11%)	$p = 0.014$
Age, median [range]	41.5 [19 – 89]	61.5 [29 – 87]	$p = 0.003$

The two groups were similar with respect to gender but varied significantly in age and race

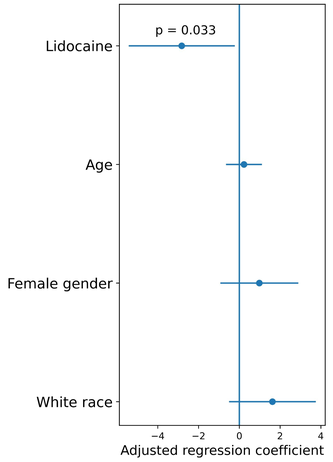
Results



After controlling for age, race, and gender, Lidocaine infusions were associated with 24% greater maximum pain reductions, p=0.016

After controlling for age, race, and gender, lidocaine infusions were also significantly associated with a lower rate of adverse side effects, with an odds ratio of 0.06, p=0.033 (OR 95% CI 0.004 – 0.8)

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



Discussion

- Our study demonstrates the potential utility of intravenous lidocaine as an effective therapy for chronic neuropathic pain
- We found that after controlling for patient demographics, lidocaine infusions were associated with significantly greater maximum pain reductions and a lower rate of adverse 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
- 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 and possible confounders
- The lack of multiple clinical sites
- A lack of functional outcomes and reliance on self-reported pains scores

Future directions

Our investigation motivates additional work in the following areas:

- Prospective studies comparing lidocaine infusions to standard of care treatments for neuropathic pain
- Studies on the durability of intravenous lidocaine's analgesic effects over time as well as the mechanism of its analgesic effect
- Studies comparing lidocaine infusion protocols

References
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