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RESEARCH

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Intravenous lidocaine and ketamine combined infusion in chronic pain relief: a follow-up study

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Abstract

Introduction: Chronic pain is a common problem worldwide. It is a significant cause of disability and is challenging to treat. Intravenous lidocaine and ketamine combined infusion is a novel treatment strategy. Data on the efficacy and acceptability of this in South Asia is sparse. We studied the same in a cohort of Sri Lankans with chronic pain resistant to usual medications.

Methods: We studied all the patients with chronic pain who were not responding to routine oral analgesic medications and underwent the above treatment at the Pain Clinic of Colombo North Teaching Hospital Ragama from March to August 2022. We followed them up from the intervention date (baseline) to 1-month post-intervention at 24-hours, 2-week, and 1-month intervals. Patients were interviewed by a medical graduate using an interviewer-administered questionnaire. Data on demographics, past medical history, and pain intensity were gathered at baseline. Pain intensity was measured at baseline and 24 hours, 2 weeks, and 1 month post-intervention, while physical and psychosocial deficits were assessed at baseline and 1-month using Brief Pain Inventory Short Form (BPISF) and compared.

Results: A total of 29 patients, 8(27.6%) of them males, with a mean age (±SD) of 53±13.3 years were studied. The mean pain score at baseline, 7 ±1.5, reduced to 3 ±1.5 at 1 month (p = 0.001). The change in BPISF parameters from baseline to 1-month post-intervention were as follows: physical deficit 5±2.0 to 3±1.9(p= 0.001), sleep 6±2.3 to 3±1.9 (p= 0.001), enjoyment of life 5±2.1 to 3±1.9(p=0.001), mood 5±2.0 to 3±1.8 (p=0.001) and sexual relationship 5±2.1 to 3±1.9 (p =0.001). There were no major adverse effects of treatment. The majority, 24(80%) were satisfied with the intervention.

Conclusion: Intravenous ketamine and lidocaine combined infusion maintained sustained pain relief and improved related parameters in the majority of this Sri Lankan cohort with resistant chronic pain.

Keywords: Ketamine, lidocaine, chronic pain relief, analgesia, local anesthetics

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Introduction

Chronic pain is a common health problem worldwide. It is a significant cause of morbidity. Morbidity due to pain affecting day-to-day life, including physical, social and psychological well-being, makes people severely debilitated.(1) It has multiple aetiologies requiring multimodal treatment, which makes it difficult to treat.(1) The overall prevalence of chronic pain globally in young adults is 11.6%, and approximately one in every nine young adults experiences chronic pain worldwide.(2) The prevalence of chronic pain among Asian adults ranges from 7.1% (Malaysia) to 61% (Cambodia and Northern Iraq). The prevalence of chronic pain is even higher among the Asian geriatric population and ranges from 42% to 90.8%.(3) However, the prevalence of chronic pain among Sri Lankans is not documented.

Intravenous (IV) lidocaine and ketamine combined infusion for chronic pain management came into practice in the 1940s in Western countries.(4) Ketamine and lidocaine doses well below the doses used in anaesthesia and treatment of arrhythmias are used as a combined infusion for relief of chronic pain under this treatment. The dose of ketamine 0.5mg/kg and lidocaine 2 mg/kg provide a synergistic effect in pain management, minimising the adverse effects.(4) The usual starting dose of lidocaine is 4 mg/kg and ketamine 0.5mg/kg and is titrated up depending on the side effect profile and improvement in pain.(4) Ketamine and lidocaine infusion has been shown to reduce chronic pain by 30% and is an accepted treatment for chronic pain in high-income countries.(5–11) No significant drug interactions have been reported with this combined infusion in the literature.(11,12)

This treatment was introduced to Sri Lanka in 2015 and is now being trialled in a few centres specialising in pain management in Sri Lanka; Colombo North Teaching Hospital, Teaching Hospital Karapitiya, Teaching Hospital Kandy, and National Hospital of Sri Lanka, but is not well established. Reports on the efficacy and acceptability of this treatment in chronic pain are scarce from South Asia, and there are no reports from Sri Lanka.(10,13)

Therefore, we aimed to study the efficacy and acceptability of lidocaine and ketamine combined infusion in the management of chronic pain in a cohort of Sri Lankans.

Methods

We conducted a cohort study at the pain clinic of the Colombo North Teaching Hospital Ragama from March 1, 2022 to August 31, 2022. A convenient sample of all patients with chronic pain, not responding to routine oral analgesics, who were offered the above treatment at the pain clinic for the first time and consented for the study were recruited.

Data on demographics, past medical history and pain intensity were gathered using an interviewer-administered questionnaire. The Sinhala-validated version of the Brief Pain Inventory Short Form (BPISF) was used to assess pain intensity and its impact on life.(14) BPISF is a universally accepted pain assessment tool used worldwide. It contains separate numerical scales for the assessment of pain, the degree to which that pain interferes with sleep, mood, enjoyment of life, and sexual life. Patient satisfaction was measured using a visual scale ranging from 0 to 10, with 10 being the highest satisfaction level. A satisfaction rating of 7 or more was taken as having been satisfied with the intervention.

In the clinic, all patients were given lidocaine 4 mg/kg and ketamine 0.5 mg/kg single dose, and we followed up for 4 weeks. Lidocaine and ketamine were combined and administered as a slow infusion over 4 hours under close observation by an anaesthetist. The patient was attached to a multipara monitor, and his/her vital signs, including blood pressure, heart rate, respiratory rate, and oxygen saturation were monitored by a pain nurse. Patients were observed for 4 hours post intervention before discharge.

Pain intensity was studied before the intervention (baseline) and 24 hours, 2 weeks, and 1 month post-intervention. Physical deficit (in the ability to perform activities of daily living such as walking, washing, brushing, climbing stairs) and psychosocial deficit (in enjoyment of life, mood, relationship with family members, sexual life and employment) were measured at baseline and 1-month post-intervention. The patients' satisfaction was assessed one month after the intervention. Adverse effects of the intervention were monitored during the intervention and follow-up.

Ethics approval for the study was obtained from the Ethics Review Committee of the Postgraduate Institute of Medicine, University of Colombo, Sri Lanka (ERC/PGIM/2021/229). Informed written consent was obtained from all the patients.

Data were analysed using the Statistical Package for Social Sciences 23.0. We compared the mean pain scores from baseline to 24 hours and baseline to 1 month post-intervention using the student t-test. We also compared the mean scores related to physical and psychosocial deficits at baseline and 1-month.

Results

A total of 29 patients, 8(27.6%) males, of mean age (±SD) 53 (±13.3) years with chronic pain, who underwent the intervention were studied. The baseline data of the study sample is shown in table 1. Back pain was the most common cause of chronic pain; 11(38%). All had pain scores ≥5 with a mean (±SD) of 7.5 (±1.46). A third of patients, 10 (34.5%), had a pain score of 10/10. Physical activity, sleep, mood and income were affected due to chronic pain in 28 (96.6%), 24 (82.8%), 24 (82.8%) and 16 (55.2%) respectively. Enjoyment and sexual life were affected in 20 (69.0%) and 14 (48.3%).

The outcome of the intervention at different points in time is shown in table 2**.** The mean pain score at baseline, 7±1.5, reduced to 3±1.5 at 1 month (p=0.001). BPISF parameters changed from baseline to 1-month post-intervention; physical deficit 5±2.0 to 3±1.9(p= 0.001), sleep 6±2.3 to 3±1.9(p=0.001), enjoyment of the life 5±2.1 to 3±1.9(p=0.001), mood 5±2.0 to 3±1.8 (p=0.001) and sexual relationship 5±2.1 to 3±1.9 (p=0.001), respectively.

The known adverse effects of the intervention are high blood pressure, tachyarrhythmia, breathing problems and drowsiness. In our study only 1 patient (3.5%) experienced an adverse effect, which was drowsiness, immediately following the intervention.

Regarding patient satisfaction and feedback, 24 (79.4%) rated the intervention as good, 3 (6.9%) had no improvement, and 1 (3.5%) did not comment on the treatment.

Discussion

We observed that intravenous ketamine and lidocaine combined infusion maintained sustained pain relief and related parameters in the majority of this cohort of patients at one month. Most patients were satisfied with the intervention and had no serious side effects.

Our findings are in keeping with the literature. A double-blind, randomised control trial carried out in Indonesia on patients with chronic low back pain also reported improvement in numeric pain rating scale as well as significant functional pain scale changes after a month.(15) The randomised, double-blind, placebo-controlled clinical trial by Gottrup et al. randomised patients with neuropathic pain to receive 0.24 mg/kg ketamine, 5 mg/kg lidocaine, or saline infusion, and the impact on ongoing or evoked pain (brush or pin-prick) showed that lidocaine reduced prick-evoked pain while ketamine reduced both ongoing and evoked pains.(16) Several other studies have found that the use of ketamine and/or lidocaine as adjuncts to opioids lowers opioid consumption.(17-20). In our study, we compared every component before and after the intervention using the numerical scales and showed a significant improvement in sleep, mood, enjoyment of life, and sexual life. A considerable improvement in all these aspects without significant side effects gives a more remarkable improvement in the quality of life for patients. The standard side effect profile of lidocaine and ketamine hallucinations, memory defects, panic attacks, vomiting, cardiovascular stimulation, and, in rare instances, hepatotoxicity was not seen with this intervention, probably because a lower dose was being used. The only side effect noted in other studies was drowsiness, which we also observed.(21)

Our study is the first report on the use of intravenous ketamine and lidocaine combined infusion in the treatment of chronic pain in Sri Lanka. We showed that this method had high satisfaction levels in addition to its effectiveness. We individually followed up with each patient just before, during, until 1-month post-intervention, which is an accurate real-world experience of the intervention. However, the study has a few limitations to acknowledge. The sample size was small, and long-term follow-up beyond 1 month was not studied. Therefore, we plan to conduct a larger study to capture the effects of repeated infusions and long-term efficacy by following them up for an extended period in the future.

Conclusion

Intravenous ketamine and lidocaine combined infusion maintained sustained pain relief and improved related parameters at 1-month post-intervention in the majority of the study sample with chronic pain resistant to the usual treatment. A higher proportion of the participants showed good satisfaction with the treatment. This intervention

Table 1 - Baseline characteristics of the sample

Characteristics	Number (%)
Age (years) (SD)	53 (±13.3)
Male n (%)	8 (27.6%)
Level of education, n (%)	
Up to Ordinary level	12 (41.4%)
Passed Ordinary level	7 (24.1%)
Advanced level	6 (20.7%)
Higher education	4 (13.8%)
Employment status	
Employed	10 (34.5%)
Unemployed	19 (65.5%)
Comorbid conditions, n (%)	
Hypertension	10 (34.5%)
Diabetes mellitus	10 (34.5%)
Ischemic heart disease	2 (6.9%)
Pulmonary diseases	3 (10.5%)
Location of pain, n (%)	
Back pain	15 (51.7%)
B/L Knee joint pain	2 (6.9%)
Trigeminal neuralgia	6 (20.7%)
Shoulder pain	4 (14.0%)
Carpal tunnel syndrome	1 (3.5%)
Phantom limb pain	1 (3.5%)
Intensity of pain [scale of 0 (lowest) to 10 (highest)], n (%)	
5	2(6.9%)
6	2(6.9%)
7	4(13.8%)
8	7(24.1%)
9	4(13.8%)
10	10(34.5%)

Table 1 - Baseline characteristics of the sample (continued...)

Characteristics	Number (%)
Adverse interference of pain in daily functioning, n (%)	
Sleep	24 (82.8%)
Physical activities	28 (96.6%)
Income	16 (55.2%)
Mood	24 (82.8%)
Enjoyment of life	20 (69.8%)
Sexual relationships	14 (48.3%)
Allergy, n (%)	
Food	2 (6.9%)
Drug	7 (24.1%)
Plaster	1 (3.5%)
No food, drug or plaster allergy	19 (65.5%)
Drug history, n (%)	
Paracetamol + codeine phosphate	1(3.5%)
Non-Steroidal Anti-Inflammatory Drugs	25 (86.2%)
Tricyclic Antidepressants	21 (72.4%)
Anti – epileptics	10 (34.5%)
Oral steroids	1 (3.5%)

Table 2 - Outcome following the intervention

Parameter	Brief Pain Inventory (mean)				
	Baseline score	24-hours post-intervention	2-weeks post-intervention	1-month post-intervention	p value*
Average Pain score	7.50	4.24	3.27	3.07	0.001
Physical activity	5.18	...	...	2.96	0.001
Mood	5.21	...	...	2.66	0.001
Sleep	5.90	...	...	2.69	0.001
Sexual life	5.10	...	...	2.66	0.001
Enjoyment of life	5.34	...	...	2.59	0.001

*baseline vs one month

Intravenous ketamine and lidocaine combined infusion maintained sustained pain relief and improved related parameters at 1-month post-intervention in the majority of the study sample with chronic pain resistant to the usual treatment. A higher proportion of the participants showed good satisfaction with the treatment. This intervention seems a plausible option for the treatment of chronic pain in Sri Lankans. However, further studies with adequate power and long-term follow-up are needed to understand the real-world benefits of the intervention in the long run.

Declarations

Conflicts of interest
None

Ethics approval
Ethics Review Committee of the Postgraduate Institute of Medicine, University of Colombo, Sri Lanka (ERC/PGIM/2021/229).

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References

1. Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain - United States, 2016. MMWR Recommendations and reports: Morbidity and mortality weekly report Recommendations and reports [Internet]. 2016 [cited 2019 Aug 14];65(1):1–49.
2. Murray CB, De La Vega R, Murphy LK et al. The prevalence of chronic pain in young adults: A systematic review and meta-analysis. Vol. 163, Pain. Lippincott Williams and Wilkins; 2022. p. E972–84.
3. Mohamed Zaki LR, Hairi NN. A Systematic Review of the Prevalence and Measurement of Chronic Pain in Asian Adults. Pain Management Nursing. 2015 Jun 1;16(3):440–52.
4. Mogahed MM, Anwar AG, Mohamed RM. Comparative Study between Intravenous Ketamine and Lidocaine Infusion in Controlling of Refractory Trigeminal Neuralgia. Journal of Anesthesia & Clinical Research. 2017;08(08).
5. Yuen R, Wong S, Mph M, et al. Title Ketamine and/or lidocaine analgesia for abdominal surgery Principal Investigator [Internet]. [cited 2024 Oct 14].
6. Mojica JJ, Schwenk ES, Lauritsen C, et al. Beyond the Raskin Protocol: Ketamine, Lidocaine, and Other Therapies for Refractory Chronic Migraine. Current Pain and Headache Reports. 2021 Dec;25(12):77.
7. Lockwood N, Misra L. Efficacy of Perioperative Intravenous Lidocaine for Multimodal Analgesia. Open Journal of Anesthesiology. 2020;10(09):299–312.
8. Zavala NA, Knoebel RW, Anitescu M. Lidocaine, and ketamine infusions as adjunctive pain management therapy: a retrospective analysis of clinical outcomes in hospitalized patients admitted for pain related to sickle cell disease. Frontiers in Pain Research. 2022 Aug 4;3:878985.
9. Striebel J, Wilhelm Ruppe, Schneider T. Simultaneous application of lidocaine and ketamine during ambulatory infusion therapy: a retrospective analysis. Pain Management. 2023 Sep 1;13(9):539–53.
10. Safakish R, Babazadeh S, Emadi T, et al. Ambulatory Infusions of Lidocaine and Ketamine for Management of Chronic Pain: An Observational Prospective Cohort Study. Age. 2022;18:90.
11. Fang H, Li HF, Yang M, et al. Effect of ketamine combined with lidocaine in pediatric anaesthesia. Journal of Clinical Laboratory Analysis, 2020•Wiley Online Library [Internet]. 2020 Apr 1 [cited 2025 Jan-Feb 14];34(4).
12. Ostović H, Šimac B, Pražetina M, et al. The Effect of Intravenous Lidocaine, Ketamine, and Lidocaine–Ketamine Combination in Colorectal Cancer Surgery: A Randomized Controlled Trial. Anesth Analg. 2025 Jan 24;140(1):67–76.
13. Breuer B, Cruciani R, Portenoy RK. Pain Management by Primary Care Physicians, Pain Physicians, Chiropractors, and Acupuncturists: A National Survey. Southern Medical Journal. 2010 Aug;103(8):738–47.
14. Im DD, Jambaulikar GD, Kikut A, et al. Brief pain inventory–short form: a new method for assessing pain in the emergency department. Pain Medicine. 2020 Dec;21(12):3263-9.
15. Sugiharto H, Hasnawi Haddani, Yuki Fitria, et al. Efficacy of Lidocaine and Ketamine Combination on Reduction of Pain Intensity, Improvement of Functional State and Central Desensitization of Chronic Low Back Pain. Bioscientia Medicina : Journal of Biomedicine and Translational Research. 2020 Oct 3;4(4):45–54.
16. Gottrup H, Bach FW, Juhl G, et al. Differential effect of ketamine and lidocaine on spontaneous and mechanical evoked pain in patients with nerve injury pain. Anesthesiology. 2006 Mar 1;104(3):527-36.
17. Anghelescu DL, Morgan KJ, Frett MJ, et al. Lidocaine infusions and reduced opioid consumption—Retrospective experience in pediatric haematology and oncology patients with refractory pain. Pediatric Blood & Cancer. 2021 Jul 15;68(11).
18. Puri L, Morgan KJ, Anghelescu DL. Ketamine and lidocaine infusions decrease opioid consumption during vaso-occlusive crisis in adolescents with sickle cell disease. Current Opinion in Supportive & Palliative Care. 2019 Dec;13(4):402–7.
19. Knox M. Comparing the Effects of Ketamine and Lidocaine on Mood, Subjective Drug Effects, and Pain. Doctoral thesis, UCL (University College London). 2018 Oct 1;

20. (PDF) The Effect of Ketamine and Lidocaine Infusion on Sleep Quality, and Quality of Life Improvement [Internet]. [cited 2025 Jan-Feb 14]. Available from: https://www.researchgate.net/publication/359579547_The_Effect_of_Ketamine_and_Lidocaine_Infusion_on_Sleep_Quality_and_Quality_of_Life_Improvement
21. Safakish R, Emadi T, Babazadeh S. Neuropathic Pain: A 5-year Retrospective Observational Study. Anesth Pain Res. 2018;2(2):1–5.

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