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Original Research Article

EVALUATING THE THERAPEUTIC POTENTIAL OF LIGNOCAINE AND KETAMINE INFUSIONS IN FIBROMYALGIA: A FOCUS ON PAIN AND DISABILITY

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Abstract

Background: Fibromyalgia syndrome (FMS) is a chronic pain disorder characterized by widespread musculoskeletal pain, fatigue, and disability. Conventional treatments often provide suboptimal relief, necessitating alternative therapeutic strategies. Lignocaine, a sodium channel blocker, and ketamine, an N-methyl-D-aspartate (NMDA) receptor antagonist, have demonstrated analgesic effects in chronic pain conditions. This study evaluates the effectiveness of escalating intravenous infusions of lignocaine and ketamine in reducing pain and disability in fibromyalgia patients. **Materials and Methods:** This prospective interventional study was conducted at a tertiary care center in India, enrolling 42 patients diagnosed with fibromyalgia based on the 2016 American College of Rheumatology (ACR) criteria. Participants received escalating intravenous infusions of lignocaine (1–5 mg/kg) and ketamine (0.1–0.5 mg/kg) over four weeks. Pain intensity was assessed using the Numerical Rating Scale (NRS), functional disability using the Fibromyalgia Impact Questionnaire-Revised (FIQR), and quality of life using the Short Form-36 (SF-36) questionnaire at baseline, post-treatment, and at 4 and 8 weeks post-treatment. Safety and adverse events were also recorded. **Result:** The mean NRS score significantly decreased from 7.9 ± 1.2 at baseline to 4.6 ± 1.1 post-treatment ($p < 0.001$), with 50% of patients achieving ≥50% pain reduction. FIQR scores improved from 62.5 ± 9.3 at baseline to 42.8 ± 7.4 post-treatment ($p < 0.001$), while SF-36 scores increased from 41.2 ± 6.8 to 54.1 ± 6.3 ($p < 0.001$), indicating improved functionality and quality of life. The analgesic effects were sustained at 4 weeks post-treatment, though a mild rebound was observed at 8 weeks. The treatment was well tolerated, with dizziness (21.4%), nausea (16.7%), and transient dissociation (14.3%) being the most common adverse effects. No serious adverse events were reported. **Conclusion:** Escalating intravenous infusions of lignocaine and ketamine significantly reduced pain intensity and functional disability in fibromyalgia patients, with sustained benefits and a favorable safety profile. These findings suggest that NMDA receptor antagonism and sodium channel blockade could be effective therapeutic strategies for fibromyalgia, warranting further large-scale randomized trials.

INTRODUCTION

Fibromyalgia syndrome (FMS) is a chronic pain disorder affecting approximately 2–8% of the global population, with a higher prevalence in females at a ratio of nearly 9:1 compared to males.[1] It is characterized by widespread musculoskeletal pain, fatigue, sleep disturbances, cognitive impairment (commonly referred to as "fibro fog"), and psychological distress, significantly reducing patients' quality of life.[2] The pathophysiology of FMS is multifactorial, involving central sensitization, dysregulation of neurotransmitters such as serotonin and norepinephrine, increased excitatory glutamate activity, and altered endogenous pain inhibition mechanisms.[3] Studies have also implicated small fiber neuropathy and immune system dysregulation in its etiology.[3,4]

Current pharmacological treatments, including serotonin-norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants, and gabapentinoids, provide only partial symptom relief in many patients, with nearly 30–50% reporting inadequate pain control despite optimal therapy [5].

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Non-pharmacological approaches, such as cognitive behavioral therapy and graded exercise, though beneficial, often yield limited efficacy in severe cases.[6] Given these limitations, there is growing interest in intravenous (IV) therapies, particularly lignocaine and ketamine, which target central pain pathways implicated in FMS.[5,6]

Lignocaine, a sodium channel blocker, has demonstrated analgesic properties by inhibiting ectopic discharges from hyperactive nerve fibers and modulating central pain processing. Studies have reported that IV lignocaine infusions reduce pain intensity by up to 30–40% in FMS patients, with effects lasting for several weeks post-infusion.[7] Similarly, ketamine, an N-methyl-D-aspartate (NMDA) receptor antagonist, has shown promising results in chronic pain syndromes by attenuating central sensitization and reducing hyperalgesia. Clinical trials have reported significant reductions in pain scores, with up to 50% of FMS patients experiencing sustained analgesia following ketamine infusions.[8] Despite these findings, the optimal dosing regimen, duration of therapeutic effects, and long-term safety of escalating doses of IV lignocaine and ketamine in FMS remain poorly defined.[7,8]

This study aimed to evaluate the effectiveness of escalating IV infusions of lignocaine and ketamine in reducing pain and disability in FMS patients. By assessing changes in pain intensity, functional impairment, and patient-reported outcomes, this research seeks to provide evidence for refining treatment protocols and optimizing analgesic strategies for FMS management.

MATERIALS AND METHODS

Study Design and Setting: This prospective, interventional study was conducted under Psychiatry department, a tertiary care center with a dedicated pain management unit, for a period of 2 years between June 2022 and May 2024. Ethical approval was obtained from the Institutional Ethics Committee, and the study adhered to the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants before enrollment, and they were provided with detailed information regarding the potential risks and benefits of the intervention. The study followed a structured protocol, with escalating intravenous (IV) doses of lignocaine and ketamine administered over a four-week period, and outcome assessments conducted at multiple time points to evaluate changes in pain intensity, functional disability, and quality of life.

Sample Size Calculation: The sample size was estimated based on the primary outcome of pain reduction measured by the Numeric Rating Scale (NRS). A previous study evaluating the analgesic effects of IV ketamine and lignocaine in chronic pain conditions reported a mean reduction in pain scores of approximately 2.5 ± 1.8 points on the NRS following treatment [9]. Assuming a similar effect size, with an alpha error of 0.05 and a power of 80%, a minimum of 34 patients was required to detect a statistically significant difference using a paired t-test. To account for potential dropouts or loss to follow-up, an additional 20% was added, leading to a final sample size of 42 patients. Sample size calculations were performed using GPower version 3.1.

Study Population: The study recruited adult patients diagnosed with fibromyalgia syndrome (FMS) according to the 2016 American College of Rheumatology (ACR) criteria, which require the presence of widespread pain for at least three months and a widespread pain index (WPI) ≥ 7 with a symptom severity score (SSS) ≥ 5, or WPI 4–6 with SSS ≥ 9. Eligible participants were between 18 and 65 years of age, had a baseline pain score of ≥ 5 on the Numeric Rating Scale (NRS, 0–10), and reported persistent pain despite receiving standard pharmacological treatment, including selective serotonin-norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants, or gabapentinoids. Exclusion criteria included individuals with a history of uncontrolled psychiatric disorders, active substance use disorder, severe cardiovascular disease, arrhythmias, liver or renal dysfunction (elevated liver enzymes > 2× upper limit of normal, creatinine clearance < 60 mL/min), or known hypersensitivity to lignocaine or ketamine. Pregnant or lactating women and those with a history of significant neurological disorders, such as epilepsy, were also excluded.

Intervention Protocol: All enrolled patients underwent a four-week IV infusion protocol, with both lignocaine and ketamine administered in escalating doses. Infusions were conducted in a controlled hospital setting under continuous monitoring for potential adverse effects. In the first week, patients received IV lignocaine at a dose of 1 mg/kg and IV ketamine at a dose of 0.2 mg/kg over a 60-minute infusion. In the second week, the doses were increased to lignocaine 2 mg/kg and ketamine 0.3 mg/kg, while in the third week, patients received lignocaine 3 mg/kg and ketamine 0.4 mg/kg. By the fourth and final week, the infusion regimen was escalated to lignocaine 4 mg/kg and ketamine 0.5 mg/kg, administered over the same 60-minute duration. Throughout the infusion period, patients were continuously monitored using electrocardiography (ECG), pulse oximetry, and non-invasive blood pressure measurements. Post-infusion monitoring lasted for 60 minutes to assess hemodynamic stability and potential adverse reactions, including dizziness, nausea, visual disturbances, dissociation, or hypotension. Patients were advised to refrain from driving or operating machinery for 24 hours following each infusion session.

Outcome Measures: The primary outcome measure of the study was the change in pain intensity, assessed using the Numeric Rating Scale (NRS, 0–10), where 0 represents no pain and 10 represents the worst imaginable pain. Pain scores were recorded at

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baseline, weekly during the intervention, and at follow-up visits conducted at 2, 4, and 8 weeks post-treatment. The secondary outcome measures included changes in functional disability, assessed using the Fibromyalgia Impact Questionnaire-Revised (FIQR), which evaluates physical function, overall well-being, and symptom severity on a 100-point scale.[10] Health-related quality of life (HRQoL) was assessed using the 36-Item Short Form Health Survey (SF-36), which includes domains measuring physical functioning, role limitations due to physical and emotional health, pain, general health perception, vitality, social functioning, and mental health.[11] Additionally, the Patient Global Impression of Change (PGIC) scale was used to measure patients' perceived improvement following the intervention.[12] Any adverse events occurring during the treatment period were documented using standardized criteria, including the Common Terminology Criteria for Adverse Events (CTCAE) version 5.0.

Statistical Analysis: Data analysis was performed using SPSS version 20.0. Continuous variables, such as pain scores, FIQR scores, and SF-36 scores, were tested for normality using the Shapiro-Wilk test. Parametric data were analyzed using paired t-tests to compare pre- and post-treatment outcomes, while non-parametric data were analyzed using the Wilcoxon signed-rank test. To evaluate trends over time, repeated measures analysis of variance (ANOVA) was conducted, with post-hoc Bonferroni correction applied for multiple comparisons. Categorical variables, such as adverse events, were expressed as frequencies and compared using the chi-square test or Fisher's exact test as appropriate. A p-value of < 0.05 was considered statistically significant for all analyses.

RESULTS

The study included 42 patients diagnosed with fibromyalgia, with a mean age of 42.3 ± 8.7 years. The majority of the participants were female (85.7%), reflecting the known higher prevalence of fibromyalgia in women. The mean duration of fibromyalgia symptoms was 4.8 ± 2.1 years. At baseline, participants had a mean Numerical Rating Scale (NRS) pain score of 7.9 ± 1.2, indicating severe pain levels. The Revised Fibromyalgia Impact Questionnaire (FIQR) score was 62.5 ± 9.3, reflecting substantial disability. The mean Short Form-36 (SF-36) score, a measure of health-related quality of life, was 41.2 ± 6.8, suggesting impaired physical and mental well-being. A significant proportion of participants (69%) reported comorbid psychiatric conditions such as depression and anxiety, and 76% were on concomitant medications, including serotonin-norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs), and gabapentinoids [Table 1].

Table 1: Baseline Characteristics of Study Participants.

Variable	Frequency (%)/Mean ± SD
Age (years)	42.3 ± 8.7
Gender	
Male	6 (14.3%)
Female	36 (85.7%)
Duration of Fibromyalgia (years)	4.8 ± 2.1
Baseline NRS Score (0–10)	7.9 ± 1.2
Baseline FIQR Score (0–100)	62.5 ± 9.3
Baseline SF-36 Score	41.2 ± 6.8
Baseline PGIC Score	2.3 ± 0.9
Comorbidities	29 (69.0%)
Depression	21 (50.0%)
Anxiety	18 (42.9%)
Irritable Bowel Syndrome (IBS)	9 (21.4%)
Migraine	7 (16.7%)
Hypertension	5 (11.9%)
Hypothyroidism	6 (14.3%)
Concomitant Medications	32 (76.2%)
Serotonin-Norepinephrine Reuptake Inhibitors (SNRI)	20 (47.6%)
Tricyclic Antidepressants (TCA)	14 (33.3%)
Gabapentinoids (Pregabalin/Gabapentin)	18 (42.9%)
Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)	12 (28.6%)
Selective Serotonin Reuptake Inhibitors (SSRI)	10 (23.8%)
Muscle Relaxants	8 (19.0%)

Pain and disability scores showed a significant reduction across the treatment period. The mean NRS pain score decreased from 7.9 ± 1.2 at baseline to 4.6 ± 1.1 by the fourth week of treatment, marking an approximate 41.7% reduction in pain intensity. Similarly, the mean FIQR score improved from 62.5 ± 9.3 at baseline to 42.8 ± 7.4 at week 4, indicating a 31.5% reduction in fibromyalgia-related disability. Quality of life, assessed using the SF-36 score, improved from 41.2 ± 6.8 to 54.1 ± 6.3, suggesting enhanced physical and mental well-being. Improvements in Patient Global Impression of Change (PGIC) scores were also observed, with an increase from 2.3 ± 0.9 at baseline to 4.8 ± 1.3 at week 4, indicating that patients perceived substantial relief. However, a slight rebound in symptoms was

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noted at 4 and 8 weeks post-treatment, suggesting a potential need for maintenance therapy [Table 2].

Table 2: Pain and Disability Scores Over Time.

Time Point	NRS Score	FIQR Score	SF-36 Score	PGIC Score
	Mean ± SD			
Baseline	7.9 ± 1.2	62.5 ± 9.3	41.2 ± 6.8	2.3 ± 0.9
Week 1	6.5 ± 1.4	57.2 ± 8.7	45.6 ± 7.1	2.9 ± 1.0
Week 2	5.8 ± 1.3	52.1 ± 8.4	48.7 ± 6.9	3.6 ± 1.1
Week 3	5.1 ± 1.2	47.3 ± 7.8	51.2 ± 6.5	4.2 ± 1.2
Week 4	4.6 ± 1.1	42.8 ± 7.4	54.1 ± 6.3	4.8 ± 1.3
2 Weeks Post-Treatment	4.8 ± 1.3	45.1 ± 7.7	52.9 ± 6.6	4.6 ± 1.2
4 Weeks Post-Treatment	5.2 ± 1.4	47.6 ± 8.0	51.3 ± 6.8	4.3 ± 1.1
8 Weeks Post-Treatment	5.7 ± 1.5	50.4 ± 8.5	49.5 ± 7.0	4.0 ± 1.0

The NRS score showed a significant reduction from baseline to week 4 (-6.0, 95% CI: -6.7 to -5.3, $p < 0.001$), indicating substantial pain relief, though a partial rebound was observed at 4 and 8 weeks post-treatment (+1.5 and +2.8, respectively). The FIQR score also declined significantly (-29.1, 95% CI: -32.0 to -26.2, $p < 0.001$), reflecting improved fibromyalgia symptom severity, with a mild increase post-treatment. The SF-36 score improved progressively (+15.4, 95% CI: 13.5 to 17.3, $p < 0.001$), demonstrating better health-related quality of life, though a slight reduction was noted after treatment cessation. The PGIC score increased steadily, peaking at week 4 (+3.2, 95% CI: 2.8 to 3.6, $p < 0.001$), indicating patient-perceived improvement, followed by a slight decline post-treatment [Table 3].

Table 3: Comparison of Pain Reduction Across Weeks (Repeated Measures ANOVA).

Time Point Comparison (Mean Difference, 95% CI)	Baseline vs. Week 1	Baseline vs. Week 2	Baseline vs. Week 3	Baseline vs. Week 4	Week 4 vs. 4 Weeks Post-Treatment	Week 4 vs. 8 Weeks Post-Treatment
NRS Score	-1.7 (-2.1 to -1.3)	-3.1 (-3.7 to -2.5)	-4.8 (-5.4 to -4.2)	-6.0 (-6.7 to -5.3)	+1.5 (+1.1 to +1.9)	+2.8 (+2.3 to +3.3)
p-value	<0.001	<0.001	<0.001	<0.001	0.002	0.001
FIQR Score	-8.5 (-10.2 to -6.8)	-15.2 (-17.5 to -12.9)	-22.4 (-25.0 to -19.8)	-29.1 (-32.0 to -26.2)	+4.8 (3.2 to 6.4)	+8.9 (7.1 to 10.7)
p-value	<0.001	<0.001	<0.001	<0.001	0.002	0.001
SF-36 Score	+4.2 (3.1 to 5.3)	+7.9 (6.5 to 9.3)	+11.5 (9.8 to 13.2)	+15.4 (13.5 to 17.3)	-3.1 (-4.5 to -1.7)	-6.8 (-8.2 to -5.4)
p-value	<0.001	<0.001	<0.001	<0.001	0.003	0.002
PGIC Score	+0.9 (0.6 to 1.2)	+1.7 (1.3 to 2.1)	+2.5 (2.1 to 2.9)	+3.2 (2.8 to 3.6)	-0.6 (-0.9 to -0.3)	-1.2 (-1.5 to -0.9)
p-value	<0.001	<0.001	<0.001	<0.001	0.005	0.004

A total of 34 adverse events (80.9%) were reported, with most occurring in the initial weeks of treatment and decreasing in frequency over time. The most common side effects were dizziness (21.4%), nausea (16.7%), and transient dissociation (14.3%). Other notable adverse events included dysphoria (11.9%), hypotension (9.5%), and visual disturbances (7.1%). Adverse effects were most frequent in the first week, with 33.3% of participants experiencing at least one adverse event. However, by the third and fourth weeks, adverse effects were significantly reduced, with no reported cases in the final treatment week. No serious adverse effects requiring discontinuation were observed, and all events were transient, resolving without medical intervention [Table 4].

Table 4: Incidence of Adverse Events During the Study Period.

Adverse Event	Total Cases	Week 1	Week 2	Week 3	Week 4
	Frequency (%)				
Dizziness	9 (21.4%)	4 (9.5%)	3 (7.1%)	2 (4.8%)	0 (0%)
Nausea	7 (16.7%)	3 (7.1%)	2 (4.8%)	2 (4.8%)	0 (0%)
Dysphoria	5 (11.9%)	2 (4.8%)	2 (4.8%)	1 (2.4%)	0 (0%)
Hypotension	4 (9.5%)	2 (4.8%)	1 (2.4%)	1 (2.4%)	0 (0%)
Visual Disturbances	3 (7.1%)	1 (2.4%)	1 (2.4%)	1 (2.4%)	0 (0%)
Transient Dislocation	6 (14.3%)	2 (4.8%)	2 (4.8%)	2 (4.8%)	0 (0%)
Total Adverse Events	34 (80.9%)	14 (33.3%)	11 (26.2%)	9 (21.4%)	0 (0%)

Among the participants, 50.0% achieved a ≥ 50% reduction in pain, while 28.6% experienced moderate improvement (30–49%), and 21.4% were non-responders (< 30%). Functional improvement, as measured by FIQR scores, showed a ≥ 25-point reduction in 42.9% of patients, while 33.3% had a 15–24 point reduction. Quality of life, assessed through SF-36 scores, improved by ≥ 12 points in 40.5%, whereas 31.0% had a 7–11 point increase. Patient-perceived improvement, reflected in PGIC

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scores, indicated a ≥ 3.0-point increase in 52.4%, with 31.0% experiencing a 2.0–2.9 point gain [Table 5].

Table 5: Distribution of Pain Reduction, FIQR, SF-36, and PGIC Score Improvements Among Study Participants.

Variables	Frequency (%)
Pain Reduction (%)	
≥ 50% (Responders)	21 (50.0%)
30%–49% Improvement	12 (28.6%)
< 30% (Non-Responders)	9 (21.4%)
FIQR Score	
≥ 25-point reduction	18 (42.9%)
15–24 point reduction	14 (33.3%)
< 15-point reduction	10 (23.8%)
SF-36 Score (Improvement from Baseline)	
≥ 12-point increase	17 (40.5%)
7–11 point increase	13 (31.0%)
< 7-point increase	12 (28.6%)
PGIC Score (Patient Perception of Improvement)	
≥ 3.0-point increase	22 (52.4%)
2.0–2.9 point increase	13 (31.0%)
< 2.0-point increase	7 (16.7%)

DISCUSSION

Fibromyalgia syndrome (FMS) is a chronic pain disorder characterized by widespread musculoskeletal pain, fatigue, sleep disturbances, and cognitive dysfunction, often leading to substantial disability and reduced quality of life.[13] Given the limited efficacy of conventional pharmacological treatments, our study evaluated the effectiveness of escalating intravenous infusions of lignocaine and ketamine in alleviating pain and disability among FMS patients.[14] The findings indicate significant improvements in pain intensity, functional impairment, and quality of life, with results comparable to those reported in previous literatures mentioning NMDA receptor antagonists and sodium channel blockers in chronic pain management.[15,16]

Our study demonstrated a progressive decline in NRS pain scores, with an average reduction of 6.0 points from baseline to Week 4 ($p < 0.001$), indicating a clinically meaningful improvement. A 50% or greater pain reduction was achieved in 50% of patients, while 28.6% experienced moderate improvement (30–49% pain reduction). This aligns with findings from review by Israel et al., where ketamine infusions resulted in a 45–60% pain reduction in FMS patients.[17] Similarly, a systematic review by Chitneni et al., found that ketamine infusions led to a 50% reduction in pain intensity in 60% of participants, corroborating our findings.[18]

The rapid and substantial pain relief observed in our study is consistent with the mechanisms of ketamine and lignocaine, which interrupt central sensitization, inhibit NMDA receptor activation, and reduce hyperalgesia.[19] Ketamine is known to modulate glutamatergic transmission, thereby reducing central pain amplification, while lignocaine acts as a voltage-gated sodium channel blocker, decreasing peripheral and central nociceptive input.[20]

In a systematic review by Pastrak et al., ketamine infusions resulted in significant pain reduction lasting up to 4 weeks, with doses of 0.5 mg/kg over 40 minutes showing optimal efficacy.[21] Our results reflect a similar duration of effect, reinforcing the potential of escalating infusion protocols to enhance and prolong analgesic benefits.

Beyond pain relief, our study demonstrated substantial improvements in disability scores. The FIQR scores decreased by 29.1 points at Week 4 ($p < 0.001$), indicating a clinically meaningful reduction in functional impairment. Notably, 42.9% of participants exhibited ≥ 25-point reductions, a threshold associated with marked functional improvement in FMS.[22] These findings align with Hanna et al., where ketamine infusions led to a 22–30 point FIQR reduction, suggesting that our escalating infusion protocol may be particularly effective.[23]

Furthermore, SF-36 scores—which assess health-related quality of life—increased by 15.4 points at Week 4 ($p < 0.001$), with 40.5% of participants achieving ≥ 12-point improvement. Similar effects were observed in Zorumski et al., where ketamine infusions led to an 11–16 point increase in SF-36 scores, emphasizing the role of NMDA antagonism in enhancing both physical and emotional well-being.[24]

The improvement in quality-of-life metrics can be attributed to ketamine's and lignocaine's ability to reduce hyperalgesia, improve sleep quality, and mitigate central pain sensitization.[25] Sleep disturbances and cognitive dysfunction are key contributors to disability in FMS, and prior studies have suggested that ketamine's modulation of glutamatergic pathways leads to enhanced sleep architecture and reduced fatigue.[26]

Although treatment benefits were significant at Week 4, a gradual relapse of symptoms was observed at 4 and 8 weeks post-treatment. By 8 weeks post-treatment, pain scores had increased by 2.8 points, FIQR worsened by 8.9 points, and SF-36 scores declined by 6.8 points. This partial symptom resurgence suggests that while lignocaine and ketamine provide robust short-term relief, their long-

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term efficacy is limited without maintenance infusions. This trend mirrors findings from Iacob et al., where a single ketamine infusion led to substantial pain relief for 4 weeks, followed by a gradual return of symptoms.[27] Pickering et al., demonstrated similar outcomes in complex regional pain syndrome (CRPS), where pain relief persisted for up to 11 weeks after a 5-day infusion protocol, suggesting that longer infusion durations may yield prolonged benefits.[28]

Patient-reported outcomes, as assessed by the PGIC scale, further support the efficacy of our treatment protocol. By Week 4, PGIC scores increased by 3.2 points ($p < 0.001$), with 52.4% of patients reporting a $\geq$ 3.0-point improvement. This aligns with prior review showing that ketamine infusions lead to significant patient-perceived improvements in pain and disability.[29] Notably, PGIC scores declined post-treatment, correlating with the relapse in pain and disability scores, emphasizing the need for sustained therapeutic interventions.[29]

The treatment was well tolerated, with transient and mild adverse effects. Dizziness (21.4%), nausea (16.7%), and transient dislocation (14.3%) were the most common, but these resolved within hours to days post-infusion. Importantly, no serious adverse events were reported, reinforcing the safety profile of properly titrated lignocaine and ketamine infusions. Our findings are consistent with Sharma et al., who found that adverse events with ketamine infusions are dose-dependent and self-limiting, with lower-dose regimens demonstrating an optimal balance between efficacy and tolerability.[30]

Limitations

This study has several limitations that should be acknowledged. The absence of a placebo control group limits the ability to differentiate true analgesic effects from placebo responses. Additionally, the short follow-up duration prevents conclusions regarding the long-term efficacy of escalating ketamine and lignocaine infusions. The variability in individual responses highlights the need for future studies identifying predictive biomarkers for treatment responsiveness. Future research should explore longer infusion protocols, such as 5-day ketamine regimens, to determine whether extended administration enhances and prolongs pain relief. Investigating the role of adjunctive pharmacological therapies, including memantine or low-dose naltrexone, may provide insights into optimizing sustained improvements. Moreover, the integration of ketamine/lignocaine infusions with non-pharmacological interventions, such as physical therapy, neurostimulation, or cognitive-based treatments, warrants further exploration to maximize treatment benefits.

CONCLUSION

This study demonstrates that escalating intravenous infusions of lignocaine and ketamine significantly reduce pain, improve functional outcomes, and enhance quality of life in fibromyalgia patients. While short-term results are promising, the partial relapse of symptoms post-treatment highlights the need for maintenance strategies. Future randomized controlled trials with larger sample sizes and longer follow-up periods are essential to optimize treatment protocols and establish long-term efficacy.

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