

Introduction

Chronic pain patients often exhibit poor response to commonly prescribed analgesics. Memantine, an oral agent with NMDA receptor antagonist properties like Ketamine, has shown promising analgesic effects in preclinical models and small-scale clinical trials. Its oral form allows for sustainable and convenient daily use, without the significant side effects associated with Ketamine. This study aims to assess the efficacy of oral Memantine in managing chronic pain patients in comparison to intravenous Ketamine.

Methods

This is a retrospective study that was performed after institutional review board approval. All chronic pain patients who received IV Ketamine infusion at Henry Ford Health system during the period between January 2000 to December 2022 were identified from our database (N= 140).

Data collected included basic demographic data such as age and sex, main diagnosis, HADS score, PHQ-9 score, opioid use, baseline VAS scores before IV Ketamine or Memantine, VAS scores after 1 hour of IV Ketamine, and 1 month after starting Memantine. Any reported side effects were documented.

Results

Table 1 Baseline demographics of study population

Demographics	N/(Mean)	(SD)/%
Age	(53.1)	(14.2)
Female gender	110	78.6%
Opioid use	36	25.7%
HADS depression	(7.11)	(4.53)
HADS anxiety	(6.91)	(4.93)
PHQ-9	(9.07)	(7.21)
Diagnosis		
Lumbar radiculopathy	40	28.5%
Fibromyalgia	48	34.2%
Neuropathy	20	14.2%
CRPS	9	6.4%
Headache	5	3.5%
Post Stroke pain	5	3.5%
Abdominal pain	4	2.8%

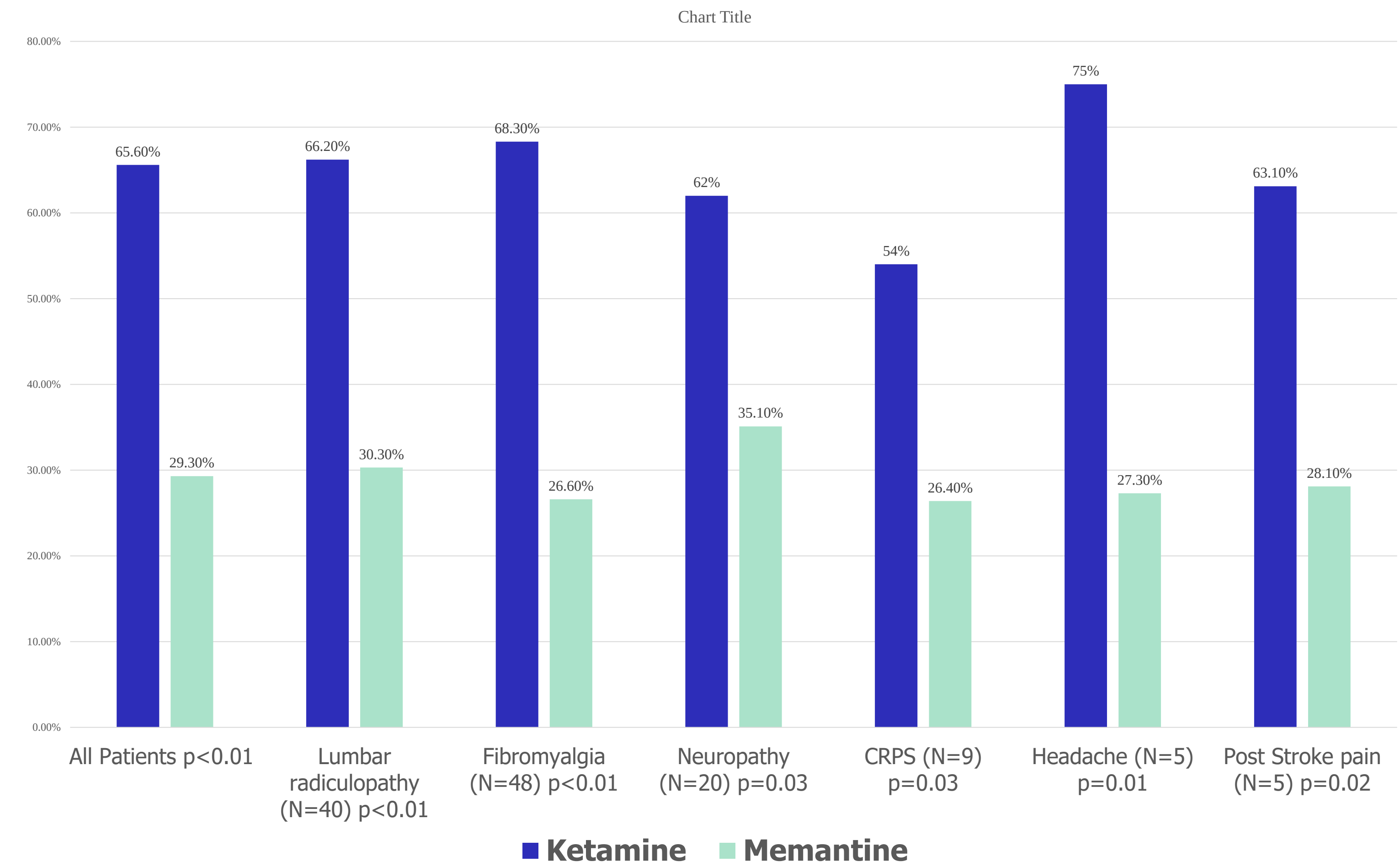


Figure 1 Percent change in VAS score pre and post treatment

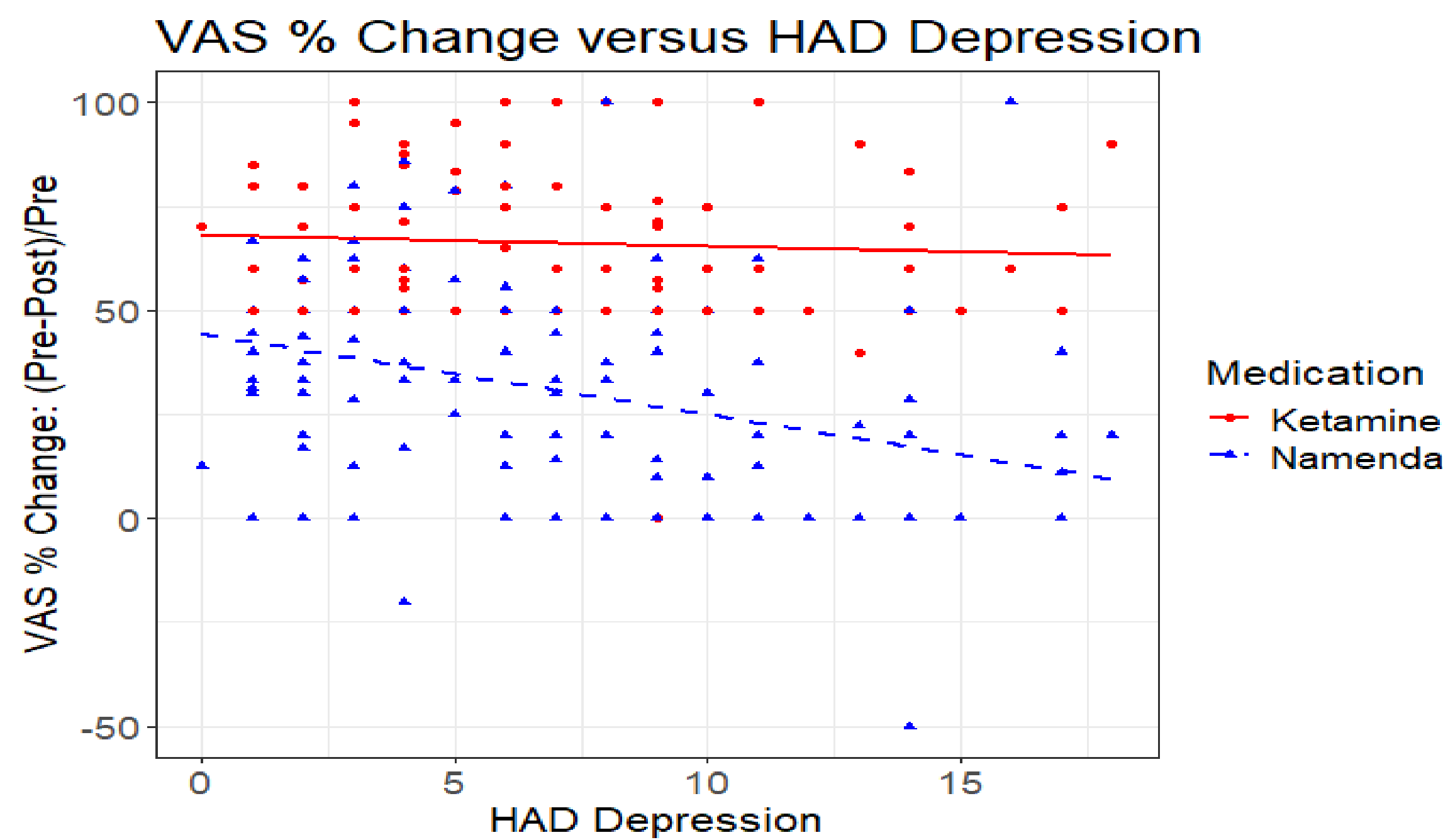


Figure 2. Scatter plot of percent change in VAS score by HADS Depression.

Table 2 Percent change in VAS score by HADS and PHQ9 scores.

	Ketamine			Memantine		p-value
	N	Corr Coeff	p-value	Corr Coeff	p-value	
HAD Depression	116	-0.06	0.48	-0.32	0.0003	0.004
HAD Anxiety	116	-0.02	0.80	-0.14	0.1340	0.221
PHQ9	81	-0.18	0.09	-0.17	0.1180	0.698

Discussion

There is conflicting evidence regarding use of Memantine in chronic pain patients. Consistent with previous research, our results did not demonstrate significant pain control with memantine compared to ketamine. Memantine's success rate in achieving >50% pain improvement was significantly lower, at only 25.7%, versus 98.6% for ketamine.

In patients with complex regional pain syndrome (CRPS), although the percent change in VAS scores was significant, the success rate (88.9% vs. 33.3%, p=0.07) was not statistically significant. This may be attributed to the limited number of CRPS patients in our study, indicating that memantine's potential role warrants further investigation.

Memantine's analgesic efficacy appeared to vary based on depression scores, with lower efficacy observed in patients with higher scores. This suggests a potential differential response based on psychological status. Further investigation is needed to clarify these findings.

Conclusion

In this study, oral Memantine did not demonstrate a statistically significant analgesic effect compared to ketamine infusion. However, patients with lower HADS depression scores may represent a subgroup that could derive greater benefit from oral memantine. Further research is warranted to identify specific patient populations that may respond favorably to oral Memantine.

References

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