RETROSPECTIVE CHART ANALYSIS OF 740 PATIENTS TREATED WITH IV KETAMINE

KETAMINE TREATMENT CENTERS

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Ketamine Treatment Centers Locations: Princeton, NJ; Potomac, MD; Denver, CO; Baltimore, MD; Raleigh, NC; West Palm Beach, FL; Philadelphia, PA

BACKGROUND

Background: The initial report of ketamine's rapid antidepressant effects in treatment resistant depression in 2000[1] has been replicated multiple times, both as a single intravenous infusion[2], and with repeated acute dosing strategies[3,4]. Over the past decade, with accumulating positive research data on the acute robust and rapidly-acting effects of low doses of intravenous ketamine, it has entered clinical use as an off-label treatment. However, there is little evidence regarding longer-term maintenance strategies, efficacy, or safety. Founded in 2011, Ketamine Treatment Centers was one of the first private clinical practices in the United States to offer IV ketamine therapy for treatment resistant depression. To date, we have treated over 1,200 patients with over 10,000 infusions, including a small number of patients treated for longer than 5 years.

Aims and Objectives: To assess the efficacy, safety, frequency, dose, and pattern of long-term treatment with IV ketamine for treatment resistant major depressive disorder, under naturalistic conditions, in a private practice setting.

Method: We undertook a retrospective chart analysis of 740 patient charts in one database treated between June, 2014, and December, 2016. Objective data included age, sex, date of initial treatment, time interval between treatments, date of last treatment, number of total treatments, adverse events, dose of ketamine administered during each treatment, and past trials of ECT and/or TMS. Qualitative data included partial and full response to treatment from patients' subjective reports and treating physician's assessment.

DEMOGRAPHICS

Location of Clinics
Princeton, NJ
Philadelphia, PA
Baltimore, MD
Potomac, MD
Raleigh, NC
Denver, CO
West Palm Beach, FL

Total Number of Patients 2014-2016	Total Number of Infusions 2014-2016	Average Number of Infusions per Patient
740	6951	9.4

Average National Age	Average Male Age	Average Female Age
45.9	45.4	47.1

National STARTING Dosage of Treatment: **0.5 mg/kg** → National Average END of Treatment Dosage: **0.623 mg/kg**

RESPONSE RATES

Total Number Patients 2014-2016	Full Responders	Percentage of Full Responders	Partial Responders	Percentage of Partial Responders	Responders = Full Responders + Partial Responders	Percentage of Full Responders + Partial Responders	Non Responders	Percentage of Non Responders
740	455	61.5%	103	13.9%	558	75.4%	182	24.6%

Both ECT and TMS Failure Response Rate to Ketamine Infusion Treatment

Total Number Patients 2014-2016	Number of Patients Failed Both ECT and TMS	Full Responders	Percentage of Full Responders	Partial Responders	Percentage of Partial Responders	Responders = Full + Partial Responders	Percentage of Full Responders + Partial Responders	Non Responders	Percentage of Non Responders
740	38	21	55.3%	7	18.4%	28	73.7%	10	26.3%

ECT Failure Response Rate to Ketamine Infusion Treatment

Total Number Patients 2014-2016	Number of Patients Failed ECT	Full Responders	Percentage of Full Responders	Partial Responders	Percentage of Partial Responders	Responders = Full + Partial Responders	Percentage of Full Responders + Partial Responders	Non Responders	Percentage of Non Responders
740	160	89	55.6%	30	18.8%	119	74.4%	41	25.6%

TMS failure Response Rate to Ketamine Infusion Treatment

Total Number Patients 2014-2016	Number of Patients Failed TMS	Full Responders	Percentage of Full Responders	Partial Responders	Percentage of Partial Responders	Responders = Full + Partial Responders	Percentage of Full Responders + Partial Responders	Non Responders	Percentage of Non Responders
740	67	38	56.7%	13	19.4%	51	76.1%	16	23.9%

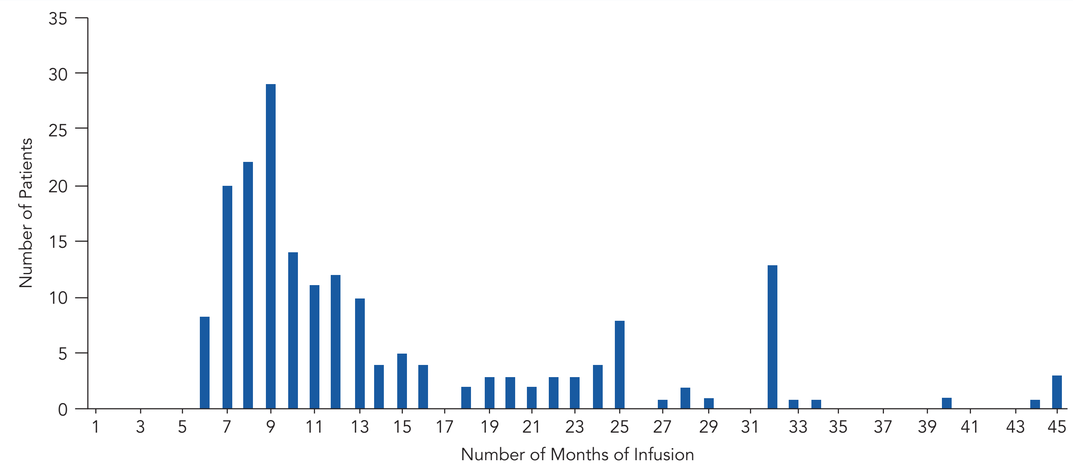
MAINTENANCE TREATMENT

Number of Patients in 2016 Alone	Number of Patients Currently on Maintenance Treatment – as of December 2016	Percentage of Patients Currently on Maintenance Treatment as of December 2016	Average Number of Weeks Between Maintenance Treatments	Average Number of Months for Maintenance Patients
515	162	31.5%	4.13	12.06 months

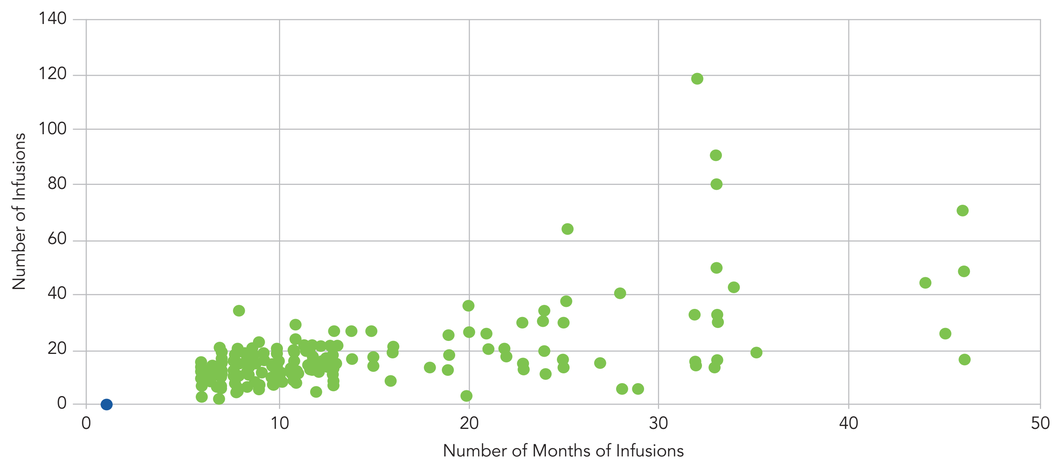
KETAMINE TREATMENT CENTERS LONG TERM KETAMINE INFUSIONS DATA

Number of Patients Treated for 6 or More Months 2014-2016	Percentage of Patients Treated for 6 or More Months	Number of Patients With Serious Adverse Events Reported
207	28%	0

Number of Patients per Months of Infusion (for at Least 6 Months of Treatment)



Number of Infusions per Month (for 207 Patients With More Than 5 Months of Infusions)



Ketamine Treatment Centers Higher Than 15 Infusions Numbers

Patient With Number Higher Than 15 Infusions	Number of Patients = 107	Number of Patients With Serious Adverse Events Reported
15	12	0
16	8	0
17	13	0
18	7	0
19	7	0
20	8	0
21	8	0
22	5	0
23	1	0
24	1	0
26	4	0
27	4	0
30	4	0
31	3	0
33	2	0
34	3	0
36	1	0
38	1	0
41	1	0
43	1	0
45	1	0
49	1	0
50	2	0
64	1	0
65	1	0
70	1	0
80	1	0
81	1	0
91	1	0
118	1	0

Ketamine Treatment Centers Higher Than 5 Months of Treatment and 15 Infusions

Number of Months in Treatment for Higher Than 15 Infusions Patients	Number of Patients
5	4
6	1
7	4
8	11
9	15
10	9
11	7
12	10
13	6
14	4
15	5
16	3
18	2
19	2
20	2
21	2
22	3
23	2
24	3
25	8
27	1
28	1
32	4
33	9
34	1
35	1
44	1
45	1
46	3

DISCUSSION AND CONCLUSION

Contrary to speculation that ketamine's rapid acute antidepressant effects are too short-lived for practical usefulness in the maintenance phase of treatment, we are encouraged to see that this cohort of 740 patients had an average interval between treatments of 4.13 weeks. In addition, the lack of any reported severe adverse events in this large group with repeated exposure is encouraging evidence of long-term safety and tolerability. Of particular note is the consistency of response across all patients, including those who had previously failed ECT, TMS, or both. Average total time in treatment was approximately 1 year, with the modal patient in treatment for 9 months.

REFERENCES

1. Berman RM, Cappiello A, Anand A, et al. Antidepressant effects of ketamine in depressed patients. *Biol Psychiatry*. 2000;47(4):351-354.
2. Zarate CA Jr, Singh JB, Carlson PJ, et al. A randomized trial of an N-methyl-D-aspartate antagonist in treatment-resistant major depression. *Arch Gen Psychiatry*. 2006;63(8):856-864.
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4. Singh JB, Fedgchin M, Daly EJ, et al. A double-blind, randomized, placebo-controlled, dose-frequency study of intravenous ketamine in patients with treatment-resistant depression. *Am J Psychiatry*. 2016;173(8):816-826.