

Title: Use of Early Ketamine Sedation and Association with Clinical and Cost Outcomes among Mechanically Ventilated Patients with Covid-19: A Retrospective Cohort Study

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Supplemental Table 1 Cohort Demographic Characteristics Before and After Propensity Score Matched Analysis

Variables	Before Matching		Standardized Difference	After Matching		Standardized Difference
	Ketamine Group (n=1423) patients, N%	Other Group (n=41531) patients, N%		Ketamine Group (n=1390) patients, N%	Matched Group (n=1390) patients, N%	
Demographics						
Age (mean, IQR)	59 [48, 68]	65 [55, 74]	0.36	59 [49, 68]	59 [49, 68]	0.01
Sex			0.08			0.03
Female	505 (35.5%)	16578 (39.9%)		492 (35.4%)	472 (34.0%)	
Male	918 (64.5%)	24939 (60.0%)		898 (64.6%)	918 (66.0%)	
Unknown	0 (0.0%)	14 (0.0%)				
Race			0.25			0.04
Asian	39 (2.7%)	1168 (2.8%)		37 (2.7%)	46 (3.3%)	
Black	220 (15.5%)	7611 (18.3%)		215 (15.5%)	220 (15.8%)	
Other	277 (19.5%)	5110 (12.3%)		266 (19.1%)	268 (19.3%)	
Unknown	111 (7.8%)	2094 (5.0%)		111 (8.0%)	100 (7.2%)	
White	776 (54.5%)	25548 (61.5%)		761 (54.7%)	756 (54.4%)	
Ethnicity			0.18			0.03
Hispanic	342 (24.0%)	6938 (16.7%)		330 (23.7%)	341 (24.5%)	
Non-Hispanic	804 (56.5%)	26630 (64.1%)		787 (56.6%)	789 (56.8%)	
Unknown	277 (19.5%)	7963 (19.2%)		273 (19.6%)	260 (18.7%)	
Payor Category			0.40			0.04
Managed Care	364 (25.6%)	5833 (14.0%)		351 (25.3%)	338 (24.3%)	
Medicaid	256 (18.0%)	6516 (15.7%)		249 (17.9%)	255 (18.3%)	
Medicare	527 (37.0%)	22882 (55.1%)		520 (37.4%)	537 (38.6%)	
Other	276 (19.4%)	6300 (15.2%)		270 (19.4%)	260 (18.7%)	
Discharge Month			0.05			0.02
April 2020	163 (11.5%)	4702 (11.3%)		159 (11.4%)	160 (11.5%)	

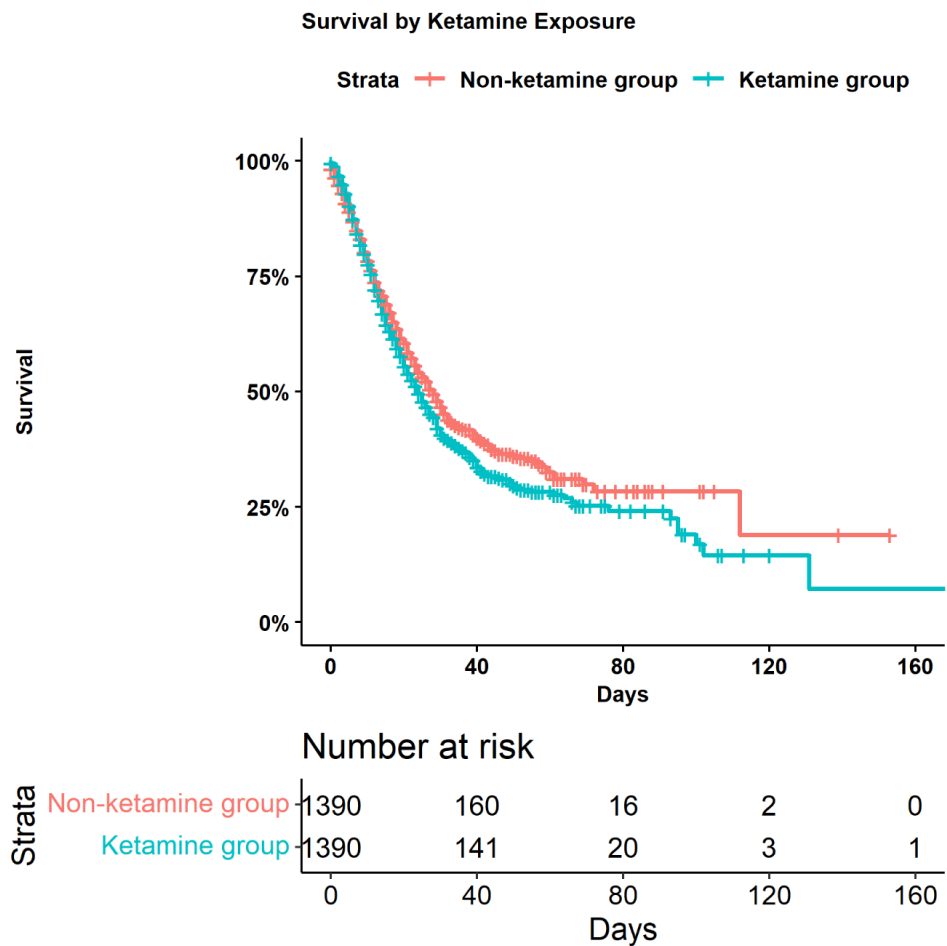
May 2020	162 (11.4%)	3057 (7.4%)	161 (11.6%)	149 (10.7%)	
June 2020	88 (6.2%)	1739 (4.2%)	82 (5.9%)	74 (5.3%)	
July 2020	79 (5.6%)	2523 (6.1%)	77 (5.5%)	77 (5.5%)	
August 2020	78 (5.5%)	2439 (5.9%)	78 (5.6%)	73 (5.3%)	
September 2020	54 (3.8%)	1721 (4.1%)	54 (3.9%)	60 (4.3%)	
October 2020	71 (5.0%)	1793 (4.3%)	70 (5.0%)	74 (5.3%)	
November 2020	107 (7.5%)	3065 (7.4%)	104 (7.5%)	105 (7.6%)	
December 2020	137 (9.6%)	5489 (13.2%)	135 (9.7%)	142 (10.2%)	
January 2021	126 (8.9%)	5710 (13.7%)	124 (8.9%)	113 (8.1%)	
February 2021	110 (7.7%)	3429 (8.3%)	106 (7.6%)	115 (8.3%)	
March 2021	59 (4.1%)	1960 (4.7%)	58 (4.2%)	54 (3.9%)	
April 2021	65 (4.6%)	1644 (4.0%)	64 (4.6%)	73 (5.3%)	
May 2021	76 (5.3%)	1418 (3.4%)	74 (5.3%)	72 (5.2%)	
June 2021	48 (3.4%)	842 (2.0%)	44 (3.2%)	49 (3.5%)	
Hospital Characteristics					
Bed Count			0.39		N/A
000-099	15 (1.1%)	1338 (3.2%)	12 (0.9%)	12 (0.9%)	
100-199	73 (5.1%)	4970 (12.0%)	70 (5.0%)	70 (5.0%)	
200-299	139 (9.8%)	6692 (16.1%)	136 (9.8%)	136 (9.8%)	
300-399	276 (19.4%)	8054 (19.4%)	257 (18.5%)	257 (18.5%)	
400-499	219 (15.4%)	4967 (12.0%)	219 (15.8%)	219 (15.8%)	
500+	701 (49.3%)	15510 (37.3%)	696 (50.1%)	696 (50.1%)	
Provider Region					
			0.32		N/A
Midwest	285 (20.0%)	9710 (23.4%)	280 (20.1%)	280 (20.1%)	
Northeast	222 (15.6%)	5920 (14.3%)	217 (15.6%)	217 (15.6%)	
South	789 (55.4%)	18136 (43.7%)	768 (55.3%)	768 (55.3%)	

West	127 (8.9%)	7765 (18.7%)		125 (9.0%)	125 (9.0%)	
Setting			0.14			N/A
Rural	94 (6.6%)	4311 (10.4%)		91 (6.5%)	91 (6.5%)	
Urban	1329 (93.4%)	37220 (89.6%)		1299 (93.5%)	1299 (93.5%)	
Teaching Status			0.25			N/A
Non-teaching	490 (34.4%)	19430 (46.8%)		466 (33.5%)	466 (33.5%)	
Teaching	933 (65.6%)	22101 (53.2%)		924 (66.5%)	924 (66.5%)	
Admission Source						
Transfer from a hospital (different facility)	423 (29.7%)	7809 (18.8%)		415 (29.9%)	423 (30.4%)	
Comorbidity						
van Walraven Score (mean, IQR ^a)	5 [0, 10]	6 [1, 12]	0.24			
Congestive heart failure	233 (16.4%)	9958 (24.0%)	0.17	230 (16.5%)	239 (17.2%)	0.02
Valvular disease	32 (2.2%)	2241 (5.4%)	0.15	32 (2.3%)	34 (2.4%)	0.01
Pulmonary circulation disease	61 (4.3%)	1577 (3.8%)	0.02	61 (4.4%)	68 (4.9%)	0.02
Peripheral vascular disease	47 (3.3%)	2065 (5.0%)	0.07	47 (3.4%)	52 (3.7%)	0.02
Paralysis	66 (4.6%)	1627 (3.9%)	0.01	60 (4.3%)	71 (5.1%)	0.04
Other neurological disorders	116 (8.2%)	5302 (12.8%)	0.15	116 (8.3%)	129 (9.3%)	0.03
Chronic pulmonary disease	358 (25.2%)	11088 (26.7%)	0.02	351 (25.3%)	339 (24.4%)	0.02
Diabetes without chronic complications	160 (11.2%)	4638 (11.2%)	<0.01	156 (11.2%)	170 (12.2%)	0.03
Diabetes with chronic complications	474 (33.3%)	16006 (38.5%)	0.10	466 (33.5%)	455 (32.7%)	0.02
Hypothyroidism	186 (13.1%)	6119 (14.7%)	0.03	181 (13.0%)	186 (13.4%)	0.01
Renal failure	185 (13.0%)	8243 (19.8%)	0.18	184 (13.2%)	175 (12.6%)	0.02
Liver disease	119 (8.4%)	3099 (7.5%)	0.02	116 (8.3%)	133 (9.6%)	0.04
Peptic ulcer Disease with bleeding	5 (0.4%)	491 (1.2%)	0.10	4 (0.3%)	7 (0.5%)	0.02

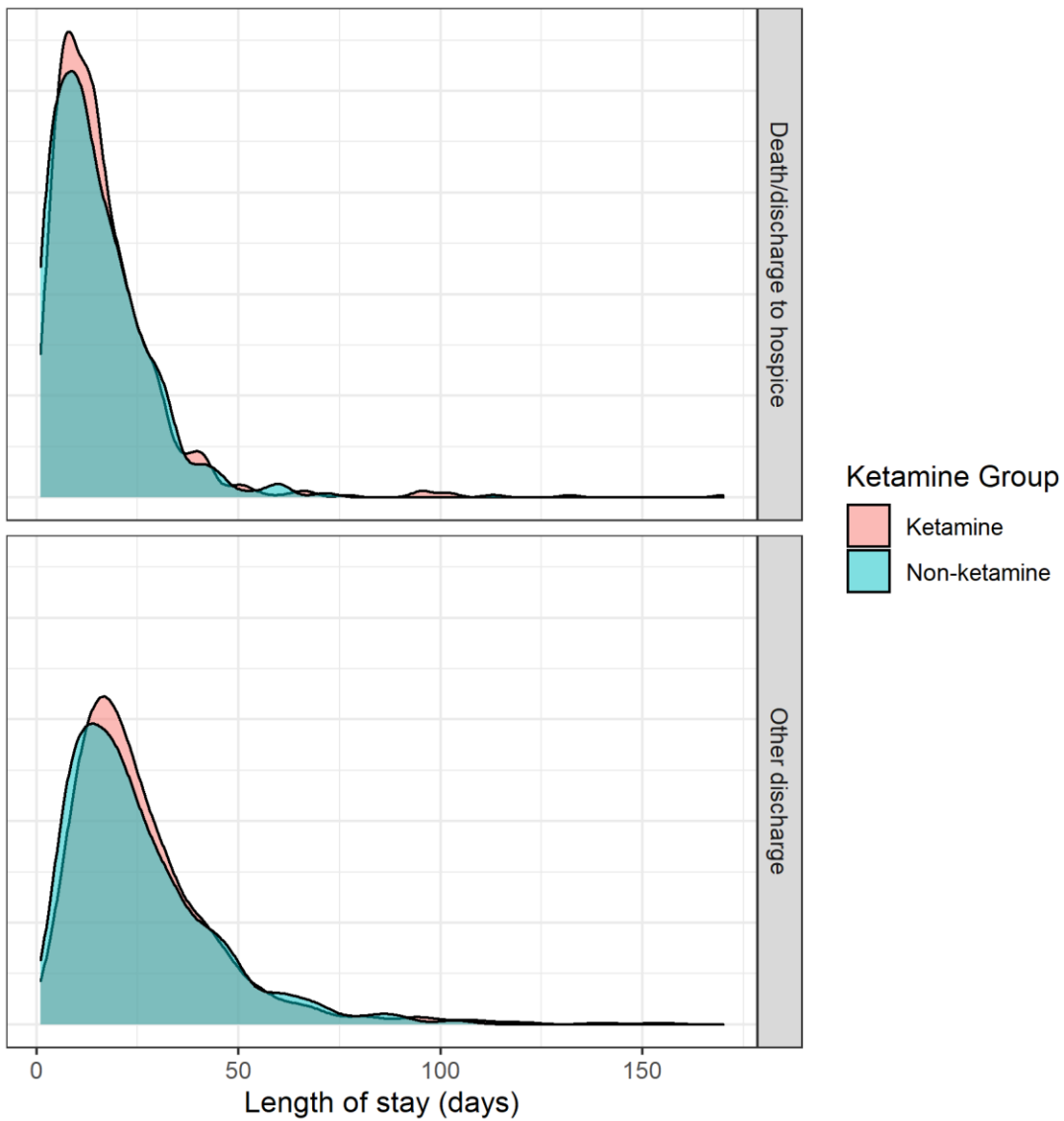
Acquired immune deficiency syndrome	1 (0.1%)	29 (0.1%)	<0.01	1 (0.1%)	1 (0.1%)	0
Lymphoma	10 (0.7%)	316 (0.8%)	0.01	10 (0.7%)	13 (0.9%)	0.02
Metastatic cancer	9 (0.6%)	421 (1.0%)	0.05	9 (0.6%)	5 (0.4%)	0.03
Solid tumor without metastasis	19 (1.3%)	710 (1.7%)	0.03	19 (1.4%)	20 (1.4%)	0.01
Rheumatoid arthritis/collagen vas	32 (2.2%)	1336 (3.2%)	0.06	32 (2.3%)	31 (2.2%)	<0.01
Coagulopathy	200 (14.1%)	6469 (15.6%)	0.05	195 (14.0%)	200 (14.4%)	0.01
Obesity	682 (47.9%)	16494 (39.7%)	0.20	658 (47.3%)	657 (47.3%)	<0.01
Severe Obesity	409 (28.7%)	9094 (21.9%)				
BMI 30-39.9	299 (21.0%)	8050 (19.4%)				
BMI 40+	342 (24.0%)	7174 (17.3%)				
Other Obesity	278 (19.5%)	7561 (18.2%)				
Weight loss	102 (7.2%)	4183 (10.1%)	0.10	102 (7.3%)	100 (7.2%)	0.01
Fluid and electrolyte disorders	835 (58.7%)	26603 (64.1%)	0.08	819 (58.9%)	832 (59.9%)	0.02
Chronic blood loss anemia	5 (0.4%)	268 (0.6%)	0.04	5 (0.4%)	7 (0.5%)	0.02
Deficiency	343 (24.1%)	12602 (30.3%)	0.12	334 (24.0%)	344 (24.7%)	0.02
Anemias						
Alcohol abuse	51 (3.6%)	1675 (4.0%)	0.04	51 (3.7%)	51 (3.7%)	0
Drug abuse	44 (3.1%)	1228 (3.0%)	<0.01	42 (3.0%)	46 (3.3%)	0.02
Psychoses	57 (4.0%)	2138 (5.1%)	0.06	57 (4.1%)	55 (4.0%)	0.01
Depression	153 (10.8%)	4970 (12.0%)	0.01	149 (10.7%)	156 (11.2%)	0.02
Hypertension	947 (66.5%)	30544 (73.5%)	0.12	927 (66.7%)	934 (67.2%)	0.01
Co-treatments						
Neuromuscular blocking agent (within 2 days of IMV)	1103 (77.5%)	22237 (53.5%)				
Benzodiazepine (within 2 days of IMV)	1171 (82.3%)	28446 (68.5%)				

Remdesivir	536 (37.7%)	16057 (38.7%)	0.04	518 (37.3%)	511 (36.8%)	0.01
Dexamethasone	838 (58.9%)	26636 (64.1%)	0.06	819 (58.9%)	831 (59.8%)	0.02
Convalescent Plasma	92 (6.5%)	2283 (5.5%)	0.05	91 (6.5%)	89 (6.4%)	0.01
Tocilizumab	318 (22.3%)	5860 (14.1%)	0.22	306 (22.0%)	288 (20.7%)	0.03
Baricitinib	3 (0.2%)	184 (0.4%)	0.02	3 (0.2%)	4 (0.3%)	0.01
Vasopressors. (within 2 days of IMV)	716 (50.3%)	17980 (43.3%)	0.14	697 (50.1%)	687 (49.4%)	0.01
Other Sedatives (within 2 days of IMV)	1422 (99.9%)	38908 (93.7%)	0.34	1389 (99.9%)	1330 (95.7%)	0.25
Methadone (during stay)	71 (5.0%)	579 (1.4%)	0.17	65 (4.7%)	64 (4.6%)	<0.01
Gabapentinoids. (during stay)	257 (18.1%)	5415 (13.0%)	0.12	249 (17.9%)	245 (17.6%)	0.01

IQR = Interquartile range, IMV = Invasive mechanical ventilation,



Supplemental Figure 1 Survival Curves (% patient alive each day after day 2)



Supplemental Figure 2 Length of Stay Among Survivors and Non-survivors