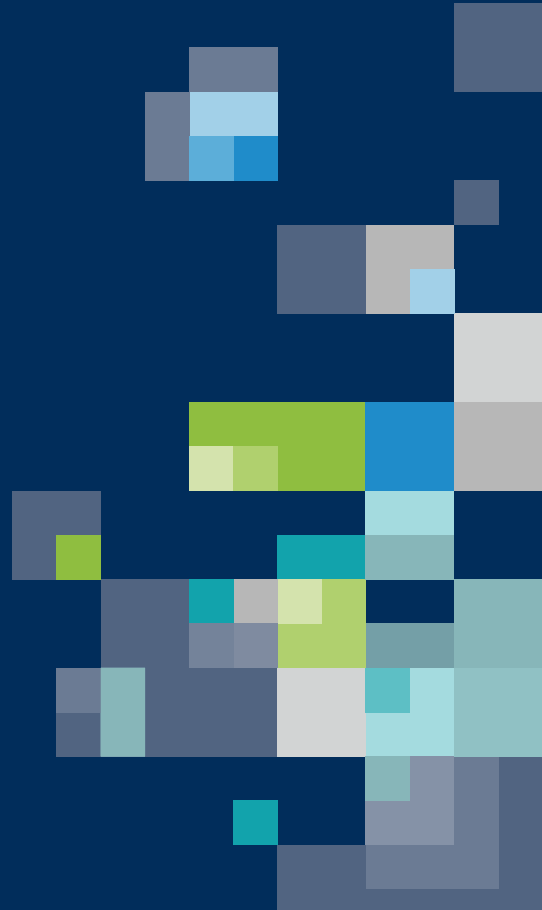


Effect of Melatonin on the Incidence of Delirium and Sleep in ICU Patients

Asher Jeong, Claire Bainbridge PharmD,
Rima Bouajram PharmD



Background

- Melatonin, an endogenous neurotransmitter that regulates the sleep-wake cycle, is often used for prevention of delirium and treatment of insomnia in critically ill patients
- Richards-Campbell Sleep Questionnaire (RCSQ) is a validated sleep assessment tool in critically ill patients
- Although multiple studies conclude that melatonin prevents incidence of delirium, the optimal dose of melatonin is unknown and currently controversial



Objectives

- Primary: Examine the incidence of delirium compared between different doses of melatonin in critically ill adult patients on psychotropic medications prior to admission
- Secondary: Evaluate the impact of melatonin use on RCSQ components when compared to melatonin alone, melatonin with alternate sleep agents, alternate sleep agents alone, or no sleep agents



Methods

- Prospective study of 268 adult patients admitted to 4 different intensive care units (ICU) (Aug 2019 – March 2020)
- Sleep agents and doses administered were recorded
- Patients evaluated for overall sleep characteristics using the RCSQ. Delirium evaluated using CAM-ICU score
- Inclusion criteria: patients on prior to admission psychotropic medication
- Exclusion criteria: patients admitted to ICU with primary neurologic process, active substance withdrawal, paralysis, pregnancy or incarceration



Table 1. Patient Demographics

Male, n (%)	45 (53)
Age, median [IQR]	64 [58,71]
On melatonin only, n* (%)	94 (%)
On melatonin + other sleep medication, n* (%)	114 (%)
ICU	90
Cardiothoracic ICU, n (%)	21 (22)
Neuro ICU, n (%)	23 (26)
Medical ICU, n (%)	23 (26)
Surgical, n (%)	23 (26)

n* = total number of assessment

Table 2. Outcome (Delirium and RASS score)



RASS score, median [IQR]	0, [-2,0]
Overall incidence of delirium, n* (%)	23, (11)

n* = total number of assessment

Table 3. Delirium Subgroup Analysis



Subgroups		CAM (+)	CAM (-)
Melatonin Dose, n*	<1mg (17)	2 (12%)	15 (88%)
	1-3mg (50)	8 (16%)	42 (84%)
	4-6mg (93)	4 (4%)	89 (96%)
	7-10mg (44)	6 (14%)	38 (86%)
	>10mg (5)	0 (0%)	5 (100%)
Sleep Medication, n*	Melatonin alone	14 (15%)	80 (85%)
	Melatonin + alternate sleep agent	9 (8%)	105 (92%)
	Alternate sleep agents alone	17 (12%)	123 (88%)
	No sleep agents	26 (10%)	224 (90%)

n* = total number of assessment

Table 4. Richards-Campbell Sleep Questionnaire

Sleep Cohorts	(Q1) Sleep Depth		(Q2) Sleep Latency		(Q3) Awakenings		(Q4) Return to Sleep		(Q5) Sleep Quality		(Q6) Noise	
	Median, [IQR]	n*	Median, [IQR]	n*	Median, [IQR]	n*	Median, [IQR]	n*	Median, [IQR]	n*	Median, [IQR]	n*
Melatonin Alone	6, [5,8]	64	6.5, [3,8.75]	58	5.5, [3,9.25]	56	7, [3,10]	47	5, [3.5,9]	55	7.5, [5,10]	52
Melatonin + alternate sleep agents	7, [4,8]	73	7, [4,8.5]	71	6, [4,8]	70	6, [4,9]	65	6, [4,8]	74	7, [5,9]	68
Alternate sleep agents alone	5, [3,9]	167	6, [3,10]	157	5, [2.5,8]	160	8, [3,10]	153	5, [2,9]	170	7, [3,10]	162
No sleep agents	6, [3,8]	59	7, [4,9]	55	6, [3,9]	55	6, [3,9]	47	6.5, [3,9]	58	9, [6.25,10]	58

n* = total number of assessment

Results

- Patients on melatonin alone had the highest incidence of delirium while those on both melatonin and other sleep agents had the least incidence of delirium
- No significant differences in sleep depth, sleep latency, awakenings, return to sleep, sleep quality, and noise, were reported based on sleep agent



Conclusion/Future Directions



- Melatonin dosing does not appear to be correlated with differences in delirium incidence
- The use of any sleep agent did not impact sleep characteristics in critically ill patients evaluated
- Future Direction: Evaluate non-pharmacologic modifications with and without medication co-administration and the impact on delirium



Thank you!

UCSF



asher.jeong@ucsf.edu