

Influence of deep sedation in ICU memories in critical COVID-19 survivors

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Introduction

Post-ICU patients are known to sustain a variety of physical and psychological sequelae after critical illness^{1,5}, and the COVID-19 pandemic has added further challenges. Psychological distress has been increasingly acknowledged as an under-recognized, prevalent problem, which can lessen recovery^{1,5}.

In particular, ICU memories play a significant role. Their routine assessment during follow-up ICU consultation is paramount to appraise psychological sequelae.

Specifically, Delusional memories are source of discomfort/anxiety after discharge, and associated with poor outcomes including delayed return to work and sleep problems^{1,7,9}.

Deep sedation has been associated with greater risk of perceiving distressing delusional memories^{7,9}, bringing a move towards lighter sedation in recent years. However, there are limited reports on post-ICU memories in COVID-19^{4,6}, and influence of deep sedation has not been fully defined.

Objective: Evaluate ICU memories in critical COVID-19 survivors and their relation with deep sedation

Materials/Methods

Adult COVID-19 ICU survivors of a Portuguese University Hospital (CHUSJ) from October-2020 to April-2021 (2nd/3rd COVID-19 "waves") were evaluated by telephone follow-up consultations 1-2 months post-hospital discharge using "ICU Memory Tool"³, to assess factual, emotional and delusional ICU memories

Exclusion criteria: ICM length of stay (LoS) ≤24h, terminal illness or major sensory loss or inability to communicate at the time of follow-up.

Part of an ongoing longitudinal study (MAPA-Mental Health in Critically ill patients with COVID-19)

Results

Study included 124 patients (65% male; median age=62y, APACHE-II score=15, SAPS-II=35, LOS=9D), 42% receiving deep sedation (median duration=18D).

Table 1. Characteristics of Critically Ill Patients Admitted with COVID-19 (n = 124)

	Median (Min-Max)
Male gender, n (%)	81 (65,3%)
Age (years)	62 (24-86)
Charlson Comorbidity Index	3 (0-8)
Acute Physiology and Chronic Health Evaluation II (APACHE-II)	15 (6-34)
Simplified Acute Physiology Score (SAPS-II)	35 (2-86)
ICU stay (days)	9 (1-120)
Hospital stay (days)	23 (6-211)
Deep sedation, n (%)	52 (41,9%)
- Duration of Deep sedation (days)	17,5 (0-118)
Invasive mechanical ventilation (IMV), n(%)	53 (42,7%)
- Duration of IMV (days)	27 (0-123)

Table 2. Influence of Deep Sedation on ICU Memory Recall in Critically Ill COVID-19 Patients (n = 124)

	Total (n = 124)	Deep Sedation (n = 52, 41,9%)	Non-/Light Sedation (n = 72, 58,1%)	P-value (Pearson Qui-Square)
Recall of ICU memories, n (%)	109 (87,9%)	42 (80,8%)	67 (93,1%)	0,038
Recall of Real Memories	108 (98,2%)	41 (95,3%)	67 (100%)	0,151
- Family visiting	35 (46,1%)	-	-	-
- Alarms	91 (82,7%)	-	-	-
- Voices	106 (96,4%)	-	-	-
- Lights	94 (85,5%)	-	-	-
- Faces	106 (96,4%)	-	-	-
- Breathing tube	29 (26,6%)	-	-	-
- Suctioning	11 (10,1%)	-	-	-
- Darkness	82 (74,5%)	-	-	-
- Clock	23 (20,9%)	-	-	-
- Tube in your nose	72 (65,5%)	-	-	-
- Ward round	106 (96,4%)	-	-	-
Recall of Emotional Memories	95 (86,4%)	42 (97,7%)	53 (79,1%)	0,006
- Being uncomfortable	53 (48,2%)	27 (62,8%)	26 (38,8%)	0,014
- Feeling confused	46 (41,8%)	31 (72,1%)	15 (22,4%)	0,000
- Feeling down	60 (54,5%)	30 (69,8%)	30 (44,8%)	0,010
- Feeling anxious/frightened	74 (67,3%)	35 (81,4%)	39 (58,2%)	0,011
- Panic	10 (9,1%)	6 (14%)	4 (6%)	0,155
- Pain	29 (26,6%)	13 (31%)	16 (23,9%)	0,416
Recall of Delusional Memories	44 (40%)	31 (72,1%)	13 (19,4%)	0,000
- Feeling that people were trying to hurt you	13 (11,8%)	12 (27,9%)	1 (1,5%)	0,000
- Hallucinations	19 (17,3%)	15 (34,9%)	4 (6%)	0,000
- Nightmares	27 (24,5%)	20 (46,5%)	7 (10,4%)	0,000
- Dreams	23 (20,9%)	16 (37,2%)	7 (10,4%)	0,001

Most participants (88%) held some memory of ICU stay, mostly for real events (98%) and emotions (86%), with only 40% reporting delusional memories.

ICU memory recall was significantly higher in non-sedated patients (p=0.038).

Percentage of emotional and delusional memories increased with deep sedation.

Factual memory recall did not differ.

To control for associated factors potentially influencing incidence of ICU emotional and delusional memories other than effect of deep sedation: 1) First we identified a number of potential confounding variables (including age, ICU scores, duration of deep sedation and ICU stay, presence of delirium) that were individually assessed for relation to incidence of ICU memories; 2) Factors demonstrating significant association were enrolled with "Deep Sedation" in Multivariate analysis, using logistic regression model, to evaluate for presence of an independent contribution of Deep Sedation

Table 3.1. Concurrent factors potentially influencing incidence of ICU emotional and delusional memories, other than deep sedation (Positive associations shown)

	Median±SE (IQR)	P-value
Recall of Emotional Memories		
Age (years)	60±12,2 [vs. 76±12,9 (22)]	0,032
ICU stay (days)	9±23,7 (15) [vs. 4±18,4 (7)]	0,041
Recall of Delusional Memories		
ICU stay (days)	16±29,7 (26) [vs. 7±15,6 (6)]	0,000
Delirium during stay, n (%)	13 (29,5%) [vs. 5(7,6%)]	0,002

Table 3.2. Logistic Regression Model for variables associated with ICU emotional and delusional memories

	OR	95% CI	P-value
Recall of Emotional Memories			
Deep sedation	7,519	0,236-240,02	0,254
Age	0,921	0,852-0,995	0,038
ICU stay	0,987	0,928-1,049	0,673
Recall of Delusional Memories			
Deep sedation	4,638	1,228-17,517	0,024
ICU stay	1,011	0,985-1,038	0,425
Delirium during stay	2,236	0,577-8,669	0,245

Deep sedation had significant, independent association with incidence of Delusional ICU memories

Conclusion: These results suggest that sedation influences incidence of ICU memories in critical COVID-19 survivors and adverse delusional recalls, requiring further studies to define its role in their occurrence, and underline the importance of communication during follow-up consultation for identification of ICU sequelae.

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