

Evaluation of the post intensive care syndrome, cognitive, psychological, physical aspects and its relation to delirium in the intensive care unit.



FOR AN ICU WITHOUT DELIRIUM TEAM www.porunaicuidelirium.com
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BACKGROUND POST INTENSIVE CARE SYNDROME (PICS)

The PICS is an entity described in 2010 by the Critical Care Medicine Society (CCMS). It is composed by the physical, cognitive and psychological sequels that patients may suffer after intensive care unit (ICU) discharge.

- The PICS include:
- MENTAL HEALTH DISORDERS:** anxiety, depression, post-traumatic stress and anguish.
 - COGNITIVE DISORDERS:** executive function disorders, attention and memory disorders.
 - PHYSICAL DISORDERS:** characterized by neuromuscular, nutritional and lung disorders.

OBJECTIVES

To evaluate the incidence of the cognitive and psychological sequels that is part of the PICS.

To study the relationship between the development of delirium during ICU stay and the development of cognitive and psychological disorders that are part of the PICS.

TABLE 1 General features of PICS population regarding delirium during ICU stay

Variables	All the patients N=43	Non-Delirium N=28	Delirium N=15	p value
Age (SD)		58 (16)	58 (16)	0.30*
Gender				0.75***
Male (%)	27 (63.0%)	17 (61.0%)	10 (67.0%)	
Female (%)	16 (37.0%)	11 (39.0%)	5 (33.0%)	
Background				0.31***
Tobacco				
NO	14 (33%)	11 (39%)	3 (20%)	
YES	29 (67%)	17 (61%)	12 (80%)	
Drug abuse				0.64***
NO	38 (88%)	24 (86%)	14 (93%)	
YES	5 (12%)	4 (14%)	1 (7%)	
Psychiatric				0.28***
NO pathology	33 (77%)	23 (82%)	10 (67%)	
YES	10 (23%)	5 (18%)	5 (33%)	
Disease severity				0.003*
APACHE II score (SD)		15 (5)	24 (11)	
Mechanical Ventilation				< 0.001
NO	22 (51%)	20 (71%)	2 (13%)	
YES	21 (49%)	8 (29%)	13 (87%)	
Stratification pathology				1.00***
Medical	28 (65%)	18 (64%)	10 (67%)	
Surgical	15 (35%)	10 (36%)	5 (33%)	
ICU Days (SD)		5 (6)	7 (4)	0.42
Length of Hospital Stay				0.33*
LOS (SD)		16 (11)	20 (14)	
MV Days (SD)		1 (2)	3 (3)	< 0.01**
Analgesic days (SD)		1 (1)	2 (1)	0.01**
Sedation (SD)		0 (1)	1 (1)	0.003**

In the Univariate analysis when we compared delirious patients with non-delirious patients, we found significant differences in the following variables: APACHE II, MV, MV days, Analgesia and Sedation days.

TABLE 2 MINI MENTAL SCALE Relationship between delirium and cognitive impairment through Mini Mental Scale - face to face interview.

Number of patients total (N=14)	Non-Delirium (N=8)	Delirium (N=6)	p value
Normal	7 (87%)	1 (17%)	
Mild cognitive impairment	1 (13%)	3 (50%)	0.036
Dementia	0 (0%)	2 (33%)	0.16



RESULTS ONLY FROM FACE TO FACE INTERVIEW

TOTAL PATIENTS 43 INTERVIEWED 14 DELIRIOUS 6 NON DELIRIOUS 8

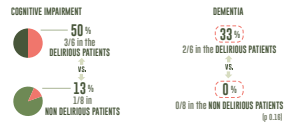


TABLE 3 PFEIFFER SCALE Relationship between Delirium and Cognitive Impairment through Pfeiffer Scale - on phone interview.

Number of patients total (N=43)	Non-Delirium (N=28)	Delirium (N=15)	p value
Mild cognitive impairment	0 (0%)	3 (21%)	0.009
Moderate cognitive impairment	0 (0%)	1 (7%)	
Normal	28 (100%)	10 (71%)	

PFEIFFER SCALE

- 28 non delirious
- 43 patients
- 15 delirious

COGNITIVE IMPAIRMENT WAS ASSOCIATED WITH PATIENTS THAT DEVELOPED DELIRIUM IN THE ICU

- 3 mild cognitive impairment
- 1 moderate cognitive impairment
- impairment (p=0.001)

DELIRIOUS PATIENTS vs. NON DELIRIOUS PATIENTS

- 21% (3/15) vs. 7% (1/15)
- 0% (0/28) vs. 0% (0/28)

TABLE 4 Relationship between Delirium and other aspects of Post ICU Syndrome. Depression - DE BECK SCALE. Dependence for DBA - BARTHEL SCALE.

Scales	Non-Delirium (N=28)	Delirium (N=15)	p value
Type of interview			
Face to face (14)	8 (28%)	6 (47%)	0.18
On the phone (29)	21 (76%)	9 (60%)	
Barthel Classification Pre ICU - N=43			0.78
Mild dependence	3 (11%)	1 (7%)	
Moderate dependence	1 (4%)	0 (0%)	
Severe dependence	1 (4%)	2 (13%)	
Total dependence	0 (0%)	0 (0%)	
Independent	23 (82%)	12 (82%)	
Barthel Classification Post ICU - N=43			0.23
Mild dependence	8 (18%)	1 (7%)	
Moderate dependence	2 (7%)	2 (13%)	
Severe dependence	2 (7%)	0 (0%)	
Total dependence	0 (0%)	2 (13%)	
Independent	19 (60%)	10 (67%)	
De Beck II Classification N=14			0.57
Minimum depression	4 (50%)	4 (72%)	
Mild depression	2 (25%)	1 (14%)	
Moderate depression	0 (0%)	0 (0%)	
Severe depression	2 (25%)	1 (14%)	

Barthel scale was applied pre and post ICU

BARTHEL PRE ICU

- Mild dependence: 4 vs 3
- Moderate dependence: 1 vs 1
- Severe dependence: 3 vs 1
- Total dependence: 3 vs 2
- Independent patients: 35 vs 23

BARTHEL POST ICU

- Mild dependence: 6 vs 5
- Moderate dependence: 4 vs 2
- Severe dependence: 2 vs 2
- Total dependence: 2 vs 2
- Independent patients: 29 vs 19

DE BECK II

- Minimum depression: 4 vs 4
- Mild depression: 8 vs 4
- Medium depression: 3 vs 2
- Moderate depression: 0 vs 0
- Severe depression: 3 vs 2

METHODS

Prospective study of transversal cohort, through an after one-year follows up of patients who were hospitalized in the Pasteur Hospital ICU between March 1st, 2017 and May 31st, 2017.

2 interviews were conducted

A first phone interview was made to the 43 patients, in which they were invited to participate in the study and several scales were applied.

Additionally, they were invited to a second face to face interview (14/43) where other scales were applied.

The conditions of the patients before ICU admission were considered.

The following scales were applied:

HAMILTON: to assess anxiety (on the phone).

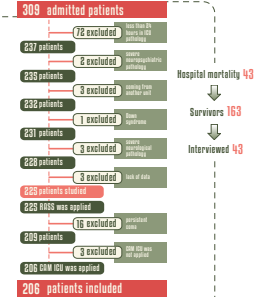
DE BECK II: to assess depression (face to face).

PFEIFFER: to assess cognitive impairment (on the phone).

MINI MENTAL: to assess cognitive state (face to face).

BARTHEL: to assess physical disability for the daily basic activities (DBA) (on the phone).

FIGURE 1 Flowchart



Patients in the Pasteur Hospital ICU between March 1st, 2017 and May 31st, 2017. Delirium incidence: total population 8%, MV patients 7%.

TABLE 5 Relationship between Delirium and all the aspects of Post ICU Syndrome Hamilton Scale, De Beck II Scale, Barthel Scale, Mini-Mental Scale and Pfeiffer Scale.

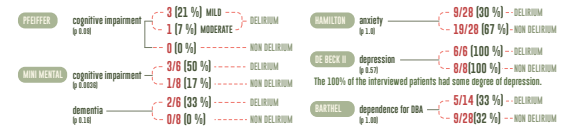
Scales	Level	Non-Delirium (N=28)	Delirium (N=15)	p value
FACTOR				
On phone and face to face interview N=43		28	15	
PFEIFFER				0.009
Normal	28 (100%)	10 (71%)		
Impairment	0 (0%)	4 (26%)		
BARTHEL PRE ICU				1.0
Normal	23 (82%)	12 (80%)		
Dependence	5 (18%)	3 (20%)		
BARTHEL POST ICU				1.0
Normal	19 (68%)	10 (67%)		
Dependence	9 (32%)	5 (33%)		
HAMILTON				1.0
Normal	8 (30%)	3 (20%)		
Anxiety	19 (70%)	9 (78%)		
FACE TO FACE INTERVIEW N=14				1.0
DE BECK II				1.0
Normal	0 (0%)	0 (0%)		
Depression	8 (100%)	6 (100%)		
MINI MENTAL				0.036
Normal	7 (87%)	1 (17%)		
Impairment	1 (13%)	5 (83%)		

In table 5 we compared delirious patients with non delirious patients and their relationship with some degree of alteration in the different scales.

Scale	Level	Non-Delirium	Delirium	p value
PFEIFFER				
Normal	38	28	10	
Impairment	4	4	4	
BARTHEL PRE ICU				
Normal or independent	35	23	12	
Dependence	8	5	3	
BARTHEL POST ICU				
Normal or independent	29	19	10	
Dependence	14	9	5	
HAMILTON				
Normal	11	8	3	
Anxiety	28	19	9	

IN SUMMARY: Development of Delirium in the ICU could not be associated with development of impairment in the psychological area (Depression De Beck II, Anxiety Hamilton or DBA Barthel), but it could be associated with cognitive impairment (Mini-Mental and Pfeiffer).

Later Delirium was associated with the different scales observing the following:



CONCLUSIONS

Cognitive impairment was from the statistical point of view significantly higher in the patients that developed Delirium in the ICU than in the patients that did not, a result that coincides with international bibliography.

Even though dependence for DBA was higher in delirious patients, there were no significant differences between both groups, as it also happens with post ICU anxiety and depression.

New future studies are necessary to continue evaluating the influence of delirium in the development of post ICU syndrome.

BIBLIOGRAPHY

Northam, D. W., Davidson, J., Cohen, H., Hopkins, R. O., Weiner, C., Wisch, H., ... & Brady, S. L. (2012). Improving long-term outcomes after discharge from intensive care unit: report from a stakeholder conference. *Critical care medicine*, 40(8), 502-509.

Duggan, M. C., Wang, L., Wilson, J. L., Dittus, J. L., & Jackson, J. C. (2017). The relationship between cognitive dysfunction, depression, and mental health-related quality of life in survivors of critical illness: Results from the BRIM-ICU investigation. *Journal of critical care*, 37, 72-79.

Pachatz, P. P., Girard, T. D., Jackson, J. C., Marandi, H., Thompson, J. L., Post, B. T., ... & Means, K. G. (2012). Long-term cognitive impairment after critical illness. *New England Journal of Medicine*, 365(11), 1306-1316.