Post-Intensive Care Unit Psychiatric Comorbidity and Quality of Life

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ABSTRACT

The prevalence of psychiatric symptoms ranges from 17-44% in intensive care unit (ICU) survivors. The relationship between the comorbidity of psychiatric symptoms and quality of life (QoL) in ICU survivors has not been carefully examined. This study examined the relationship between psychiatric comorbidities and QoL in 58 survivors of ICU delirium. Patients completed three psychiatric screens at three months after discharge from the hospital: the Patient Health Questionnaire (PHQ-9) for depression, the Generalized Anxiety Disorder-7 (GAD-7) for anxiety, and the Post-Traumatic Stress Syndrome (PTSS-10) for PTSD. Patients with 3 positive screens (PHQ-9 ≥ 10, GAD-7 ≥ 10, and PTSS-10 > 35) comprised the high psychiatric comorbidity group. Patients with 1-2 positive screens were defined as the low to moderate psychiatric comorbidity group. Patients with 3 negative screens were defined as the no psychiatric morbidity group. 31% of patients met the criteria for high psychiatric comorbidity. After adjusting for age, gender, Charlson Comorbidity Index, discharge status, prior history of depression and anxiety, patients who had high psychiatric comorbidity were more likely to have a poorer QoL compared to the low to moderate comorbidity and no morbidity groups, as measured by a lower EQ-5D-3L Index (no = 0.69 ± 0.25, low-moderate = 0.70 ± 0.19, high = 0.48 ± 0.24; *P* = 0.017). Future studies should confirm these findings and examine whether survivors of ICU delirium with high psychiatric comorbidity have different treatment needs from survivors with lower psychiatric comorbidity.

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INTRODUCTION

The prevalence of depression, anxiety, and post-traumatic stress disorder (PTSD) symptoms in ICU survivors ranges from 17-44%.[1-4] Psychiatric comorbidity, the presence of two or more psychiatric disorders, is highly prevalent in survivors of acute respiratory distress syndrome and is associated with higher mortality in post-surgical ICU survivors.[5-7] While long-term cognitive impairment in patients with ICU delirium has been associated with poor quality of life (QoL),[1] the effects of psychiatric comorbidity on QoL among similar patients are not as well understood. In this study, we examined whether psychiatric comorbidity was associated with poorer QoL in survivors of ICU delirium.

METHODS

We examined subjects who participated in the Pharmacologic Management of Delirium (PMD) clinical trial. This trial examined the efficacy of a pharmacological intervention for patients who developed ICU delirium at a local tertiary care academic hospital.[8] Out of 62 patients who participated in the follow-up of the PMD study, 58 completed Quality of Life interviews and validated psychiatric screens (Patient Health Questionnaire (PHQ-9) for depression, the Generalized Anxiety Disorder-7 (GAD-7) for anxiety, and the Post-Traumatic Stress Syndrome (PTSS-10) Scale for PTSD) at three months after hospital discharge. High psychiatric comorbidity was defined as significant symptoms for all three conditions (depression: PHQ-9 score ≥ 10, anxiety: GAD-7 ≥ 10, and PTSD: PTSS-10 > 35). No significant symptoms for all three conditions was defined as no psychiatric morbidity. Significant symptoms for 1-2 conditions were defined as low-moderate psychiatric comorbidity.

Participants also completed two complementary QoL measures, the EQ-5D-3L Index and the EQ-5D-Visual Analog Scale (EQ-5D-VAS).[9] The EQ-5D-3L Index asks participants to rate themselves as having 1: no problems, 2: some problems or 3: extreme problems on five scales:

mobility, self-care, usual activities, pain/discomfort, and anxiety/depression. The scores are then indexed against the U.S. population to create a continuous index scale ranging from -0.11 to 1.00. A score of 1 represents perfect health, 0 represents death and negative values indicate a health state worse than death. The EQ-5D-VAS asks participants to draw a line on a visual scale from an anchor box to the point that represents their health state. The score ranges from 0 being worst imaginable health state to 100 being best imaginable health state. Demographic, clinical characteristics, and prior history of depression, anxiety, and PTSD were obtained through PMD study records and clinical records. The Charlson Comorbidity Index, which measures chronic co-morbidities, and APACHE II, which estimates acute severity of illness within 24 hours of ICU admission, were calculated from patients' available clinical information.

Fisher's exact tests were used to compare dichotomous outcomes. ANOVA was used to compare continuous outcomes across the 3 psychiatric groups. ANCOVA was used to determine whether psychiatric comorbidity in survivors of ICU delirium was associated with QoL measures. Models were adjusted for the following covariates: age, gender, Charlson Comorbidity Index, discharged to home, prior history of depression, and prior history of anxiety. To assess the relationship of psychiatric comorbidity with QoL, we chose the two continuous QoL measures as the outcome since we were interested in the effect of psychiatric burden on QoL Therefore we used ANCOVA with QoL as the dependent variable and psychiatric burden as an independent variable. Pairwise comparisons were then performed when overall differences were significant ($P < 0.05$). We performed two separate sensitivity analyses. The first analysis looked solely at the subgroup of patients from the MICU. We also recalculated the EQ-5D-3L index excluding the anxiety/depression item.

RESULTS

Nearly one-third of patients (18/58) had high psychiatric burden. Table 1 compares the demographic and clinical characteristics of patients with high psychiatric comorbidity with those of low to moderate psychiatric comorbidity and with no psychiatric morbidity. Patient groups did not differ significantly in terms of demographics. For clinical characteristics, patients with high psychiatric comorbidity were more likely than patients with low to moderate psychiatric comorbidity to have a prior history of depression ($P < 0.05$).

Patients with high psychiatric comorbidity were more likely to have a poorer QoL when compared to patients with low to moderate psychiatric comorbidity and with no morbidity, as measured by a lower EQ-5D-3L Index (no = 0.69 ± 0.25, low-moderate = 0.70 ± 0.19, high = 0.48 ± 0.24; $P = 0.006$) and EQ-5D-VAS (no = 67.0 ± 20.7, low-moderate 76.6 ± 20.0, high = 50.8 ± 22.4; $P = 0.004$). After adjustment for covariates, patients with high psychiatric comorbidity had a poorer quality of life compared to those with no morbidity or low to moderate comorbidity on the EQ-5D-3L Index ($P = 0.017$ for overall differences), whereas patients who had high psychiatric comorbidity had poorer quality of life compared to those with low to moderate comorbidity on the EQ-5D-VAS ($P = 0.039$ for overall differences) (Figure 1). Subgroup analysis of MICU patients yielded similar results. Patients with high psychiatric burden had significantly poorer quality of life as measured by the EQ-5D-3L (unadjusted p=0.044, adjusted p=0.003) and the EQ-VAS (unadjusted p=0.007 adjusted p=0.021). After excluding the anxiety/depression item from the EQ-5D-3L, we observed similar differences (no = 0.71 ± 0.24, low-moderate = 0.75 ± 0.15, high = 0.58 ± 0.22; unadjusted $P = 0.062$; adjusted P= 0.040).

DISCUSSION/CONCLUSION

Psychiatric comorbidities in ICU survivors are common and pose a significant clinical issue. Patients with multiple psychiatric comorbidities can be more complicated to identify from a

diagnostic standpoint and often require more prolonged, intensive mental health treatment compared to patients with a single psychiatric disorder.[10,11] Our study showed that high psychiatric comorbidity in survivors of ICU delirium is associated with a decreased QoL compared to those with no psychiatric comorbidity or with low to moderate psychiatric comorbidities. This finding is consistent with previous studies in the general population that patients with multiple psychiatric comorbidities are associated with a poorer QoL compared to patients with single psychiatric comorbidity.[10,11]

There is a pressing need to better characterize psychiatric comorbidities in ICU survivors because our current evidence suggests that the prevalence of psychiatric comorbidities of ICU survivors is substantially higher than that of the general population. We found that nearly a third of survivors of ICU delirium had comorbid depression, anxiety, and PTSD symptoms at three months. This is consistent with the few other studies in ICU survivors which showed a prevalence of psychiatric comorbidity of 25-33%.[5,12] These rates are substantially higher than the prevalence in the general population of 6%.[13]

The high rate of psychiatric comorbidities may render it difficult to effectively treat the mental health symptoms in ICU survivors".[14] Treating multiple psychiatric comorbidities may also be especially challenging in survivors of ICU delirium because they have a high prevalence of cognitive impairment. Mental health treatments for patients with psychiatric disorders and comorbid cognitive impairment are limited. Better characterization of psychiatric comorbidity in ICU survivors, particularly those with ICU delirium, is vital to the development of more effective, bundled treatments for this population with multiple comorbidities.

Standardized screenings of ICU survivors at high risk for psychiatric disorders, such as survivors of ICU delirium, may help to identify patients with comorbid psychiatric disorder symptoms and have them referred to appropriate treatment earlier in hopes of improving their QoL sooner. Although opportunities to deliver integrated outpatient collaborative mental health and medical care for a subspecialty population are limited, one potential model of care would be to utilize a collaborative care model in an ICU survivor clinic.[15]

Strengths of our study include the examination of psychiatric comorbidities in survivors of ICU delirium, who often have a poor QoL. A deeper understanding of psychiatric comorbidity and its relationship with quality of life (QoL) is needed to better understand how to deliver more effective treatments for these survivors. Limitations include the small sample size, a one-time measurement of psychiatric comorbidities at the 3 month follow-up based on screenings tools, and lack of objective measures of physical functioning to determine the effects of psychiatric comorbidities on physical functioning. There may also have been differences in how patients with no psychiatric comorbidity responded to the EQ-VAS due to premorbid differences (e.g. they were healthier prior to their ICU stay and perceived their survivor status more negatively). This may explain why we did not see a statistically significant difference between no psychiatric comorbidity and high psychiatric comorbidity groups on the EQ-5D-VAS. Nevertheless, we did see a difference between the low to moderate psychiatric comorbidity group on EQ-5D-VAS, and differences between the no comorbidity and low to moderate comorbidity groups versus the high comorbidity group on the EQ-5D-3L. Finally, data about psychiatric history and QoL prior to ICU hospitalization were limited. Therefore truly determining incidence versus prevalence of post-ICU comorbidities, and whether psychiatric symptoms and its effects of QoL were due to ICU hospitalization or premorbid psychiatric symptoms is difficult.

Our study demonstrated that in survivors of ICU delirium, higher comorbidity of psychiatric symptoms was associated with poorer QoL. Future studies will need to confirm these findings. We will also need to identify potentially reversible risk factors for psychiatric comorbidity and poorer QoL, and develop treatments to effectively target the mental health symptoms of survivors of ICU delirium.

REFERENCES

1. Jutte JE, Erb CT, Jackson JC. Physical, Cognitive, and Psychological Disability Following Critical Illness: What Is the Risk? *Semin Respir Crit Care Med* 2015;36:943-58.

2. Nikayin S, Rabiee A, Hashem MD et al. Anxiety symptoms in survivors of critical illness: a systematic review and meta-analysis. *Gen Hosp Psychiatry* 2016;43:23-29.

3. Rabiee A, Nikayin S, Hashem MD, et al. Depressive Symptoms After Critical Illness: A Systematic Review and Meta-Analysis. *Crit Care Med* 2016;44:1744-1753.

4. Parker AM, Sricharoenchai T, Raparla S, et al. Posttraumatic stress disorder in critical illness survivors: a metaanalysis. *Crit Care Med* 2015;43:1121-1129.

5. Bienvenu OJ, Colantuoni E, Mendez-Tellez PA et al. Co-occurrence of and remission from general anxiety, depression, and posttraumatic stress disorder symptoms after acute lung injury: a 2-year longitudinal study. *Crit Care Med* 2015;43:642-653.

6. Huang M, Parker AM, Bienvenu OJ, et al. Psychiatric Symptoms in Acute Respiratory Distress Syndrome Survivors: A 1-Year National Multicenter Study. *Crit Care Med* 2016;44:954-65.

7. Influence of Psychiatric Comorbidity on Surgical Mortality Thad E. Abrams, MD, MS; Mary Vaughan-Sarrazin, PhD; Gary E. Rosenthal, MD Arch Surg. 2010;145(10):947-953.

8. Campbell NL, Khan BA, Farber M, et al. Improving delirium care in the intensive care unit: the design of a pragmatic study. *Trials* 2011;12:139.

9. The EuroQol Group (1990). EuroQol-a new facility for the measurement of health-related quality of life. *Health Policy* 16(3):199-208.

10. Hirschfeld RM. The Comorbidity of Major Depression and Anxiety Disorders: Recognition and Management in Primary Care. *Prim Care Companion J Clin Psychiatry* 2001;3:244–254.

11. Campbell DG, Felker BL, Liu CF. Prevalence of Depression–PTSD Comorbidity: Implications for Clinical Practice Guidelines and Primary Care-based Interventions. *J Gen Intern Med* 2007;22: 711–718.

12. Wolters AE, Peelen LM, Welling MC, et al. Long-Term Mental Health Problems After Delirium in the ICU. *Crit Care Med* 2016;44:1808-1813.

13. Kessler RC, Chiu WT, Demler O et al. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005;62:617-627.

14. Mehlhorn J, Freytag A, Schmidt K, et al. Rehabilitation interventions for postintensive care syndrome: a systematic review. *Crit Care Med* 2014;42:1263-1271.

15. Khan BA, Lasiter S, Boustani MA. Critical care recovery center: an innovative collaborative care model for ICU survivors. *Am J Nurs* 2015 Mar;115:24-31.

Figure 1. Mean EQ-5D-3L Index or Mean EQ-5D-VAS Index Grouped by Psychiatric Comorbidities.

Caption:
ANCOVA models were adjusted for age, gender, Charlson comorbidity index, being discharged to home, prior history of depression, and prior history of anxiety.
All P-values are after covariate adjustment. P = 0.017 for overall trend for EQ-5D-3L Index, and P = 0.039 for overall trend for EQ-5D-VAS.
* P < 0.05 for pairwise comparison.