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Psychological Symptoms Among Surrogates of Critically Ill Patients During and Before the COVID-19 Pandemic



To the Editor:

Families of critically ill patients frequently experience anxiety, depression, and acute stress.¹ To ease this burden, clinicians encourage families to play an active

role in a patient's care by visiting the hospital and engaging with the ICU team.^{2,3} During the COVID-19 pandemic, however, many hospital systems have prohibited family visitation to limit the spread of the disease.⁴

Little is known about the family experience during the COVID-19 pandemic. We hypothesized that the lack of direct contact with the patient and the medical team would amplify the burden of anxiety, depression, and acute stress among families of ICU patients.

Methods

The subjects were surrogates of non-decisional, critically ill patients at Rush University Medical Center (RUMC), an academic, tertiary care medical center in Chicago, Illinois. Subjects, who were fluent in the English language, were randomized to receive usual care with or without additional written summaries of the patient's medical plan each day.⁵ We conducted a preliminary analysis of this ongoing institutional review board-approved clinical trial given the impact that COVID-19 has had on hospital policy and society in general.

Five days after enrollment, subjects were asked to complete the 14-question Hospital Anxiety and Depression Scale (HADS) and the 22-question Impact of Events Scale Revised (IES-R) questionnaires.^{6,7} We used mean imputation in cases of missing data. Each surrogate was categorized as either participating before the COVID-19 period (June 1, 2019-March 17, 2020) or during

the COVID-19 period (March 18, 2020-June 1, 2020). The COVID-19 period began with enrollment of the first patient with COVID-19 at RUMC and corresponded to a surge in the number of COVID-19 patients in Chicago, Illinois. There was a hospitalwide no visitation policy at RUMC during the entirety of the COVID-19 period.

We used multivariable logistic regression models to determine whether the odds of clinically significant anxiety (HADS-anxiety score ≥ 11), depression (HADS-depression score ≥ 11) or acute stress (IES-R score ≥ 33) were different among subjects enrolled before vs during the COVID-19 period. Whether the subject was randomized to receive additional written summaries of the ICU care plan was not associated with these outcomes and was not included in the final models. We used Student *t* test, Mann-Whitney *U* test, χ^2 test, and Fisher exact test as appropriate, to evaluate for significant differences among subjects according to enrollment period. All tests were two-sided, and $P \leq .05$ was considered statistically significant.

Results

Subjects who were enrolled during the COVID-19 period were younger and were more likely to be of Hispanic ethnicity than those enrolled before the COVID-19 period. Respective patients admitted during the COVID-19 period were more likely to be male, of Hispanic ethnicity, and functionally independent before the hospitalization than patients admitted before the COVID-19 period (Table 1). Subjects typically completed the HADS and IES-R questionnaires during the second week of the ICU stay (median ICU day 10; range, 4-26).

The percentage of subjects who experienced clinically significant depression was significantly greater during the COVID-19 period than it was before the COVID-19 period: 25% vs 13% (adjusted OR [aOR], 3.26; 95%CI, 1.22-8.71; $P = .02$) (Table 2). The percentage of subjects

who experienced clinically significant anxiety during the COVID-19 period was similar to the percentage before the COVID-19 period: 41% vs 35%, (aOR, 1.10; 95%CI, 0.53-2.30, $P = .80$). Median HADS scores were similar during vs before the COVID-19 period: 17 (interquartile range [IQR], 11-23) vs 16 (IQR, 10-20), $P = .35$.

The percentage of subjects who experienced clinically significant acute stress during the COVID-19 period was similar to the percentage before the COVID-19 period: 36% vs 27% (aOR, 1.15; 95%CI, 0.52-2.55; $P = .73$) (Table 2). However, median IES-R scores were greater for subjects enrolled during vs before the COVID-19 period: 27 (IQR, 16-38) vs 23 (IQR, 12-35) ($P = .049$), which was attributable to significant differences in the intrusion and hyperarousal subscales of the IES-R according to enrollment period: median scores, 11 (IQR, 7-17) vs 9 (IQR, 5-14) ($P = .04$) and 7 (IQR, 3-11) vs 4

TABLE 1] Characteristics of Patients and Subjects Enrolled Before the COVID-19 Period (June 1, 2019 - March 17, 2020) vs During the COVID-19 Period (March 18, 2020 - June 1, 2020)

Patient Characteristic	Before COVID-19	During COVID-19	P Value
	(n = 79)	(n = 80)	
Years of age, mean [SD]	59 [17]	59 [12]	.94
Sex, No. (%)			
Male	38 (48)	53 (66)	.02
Female	41 (52)	27 (34)	
Race/ethnicity, No. (%)			
White non-Hispanic	30 (38)	11 (14)	<.001
Black non-Hispanic	31 (39)	20 (25)	
Hispanic	15 (19)	41 (51)	
Other	3 (4)	8 (10)	
COVID-19 disease	0 (0)	77 (96)	<.001
Independent before hospitalization, No. (%)	49 (62)	72 (90)	<.001
Invasive mechanical ventilation, No. (%)	78 (99)	80 (100)	.50
SOFA score, mean [SD]	9 [4]	7 [4]	<.01
Outcomes, No. (%)			
Tracheostomy	13 (16)	15 (19)	.70
New renal replacement therapy	27 (34)	33 (41)	.36
ICU death	17 (22)	21 (26)	.48
Subject (surrogate) characteristic			
Relation to patient, No. (%)			
Spouse/partner	20 (25)	19 (24)	.55
Child	33 (42)	42 (53)	
Parent	8 (10)	5 (6)	
Sibling	7 (9)	6 (8)	
Other	11 (14)	8 (10)	
Years of age, mean [SD]	49 [13]	41 [12]	<.001
Sex, No. (%)			
Male	16 (20)	15 (19)	.81
Female	63 (80)	65 (81)	
Race/ethnicity, No. (%)			
White non-Hispanic	28 (35)	20 (25)	<.001
Black non-Hispanic	27 (34)	10 (13)	
Hispanic	19 (24)	42 (53)	
Other	5 (6)	8 (10)	
Christian religion, No. (%)	63 (80)	57 (71)	.21
Education, No. (%)			
High school	16 (20)	20 (25)	.54
College	34 (43)	39 (49)	
Graduate/professional school	27 (34)	19 (24)	
Did not answer	2 (3)	2 (3)	

SOFA = sequential organ failure assessment.

(IQR, 2-10) ($P = .04$), respectively. Subject scores on the avoidance subscale of the IES-R were similar during vs before the COVID-19 period: median score, 8 (IQR, 5-11) vs 7 (IQR 3-12) ($P = .37$).

TABLE 2] Multivariable Logistic Regression Models Examining the Association Between Subject Enrollment Period and the Presence of Clinically Significant Psychological Symptoms, Adjusting for Subject Age and Ethnicity

Subject Characteristic	Depression			Anxiety			Acute Stress		
	OR	95% CI	P Value	OR	95% CI	P Value	OR	95% CI	P Value
Enrollment during COVID-19 period	3.26	1.22-8.71	.02	1.10	0.53-2.30	.80	1.15	0.52-2.55	.73
Age, y	1.02	0.98-1.06	.34	0.99	0.96-1.02	.52	0.98	0.96-1.02	.33
Hispanic ethnicity	0.75	0.27-2.10	.58	1.21	0.56-2.61	.63	1.47	0.65-3.34	.35

Discussion

In this study of surrogates of critically ill patients at an urban academic medical center, subjects enrolled during the first wave of the COVID-19 pandemic were more likely to experience clinically significant depressive symptoms and the types of stress measured by the intrusion and hyperarousal subscales of the IES-R than subjects enrolled before the COVID-19 pandemic. Anxiety was an equally common symptom among subjects during both enrollment periods.

In previous studies, investigators have found that the emergence of a new infectious disease has had a negative impact on the psychological wellbeing of the population.^{8,9} There are multiple explanations for the findings in our study dealing with COVID-19. When a critically ill patient has a novel disease, families may experience greater feelings of uncertainty than when a patient has a familiar condition. In addition, families are often comforted by being able to physically see and touch their loved one, which they were not able to do during the COVID-19 period. Finally, subjects may not have believed that they understood the patient's medical condition or had more uncertainty making decisions on behalf of the patient because they did not meet with the medical team on a regular basis.¹⁰

Our results should be interpreted within the context of the study's limitations, which include small sample size and single-center design. Although we adjusted for subject age and ethnicity in multivariable models, our findings could be explained by differential characteristics of subjects between time periods. Further study is needed to more fully appreciate the different types of ICU experiences among families during the COVID-19 pandemic and to determine the best ways for clinicians to engage with families when visitation is prohibited.¹¹

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