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Malachy Clancy, PhD, OTR/L, BCPR
Thomas Jefferson University

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Does Race, Ethnicity, and Insurance Status Predict Functional Outcomes in Hospitalized COVID-19 Patients?

Malachy J. Clancy, PhD, OTR/L, BCPR
Department of Occupational Therapy, Thomas Jefferson University

Objectives

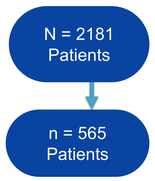
1. Understand factors associated with functional improvements in patients hospitalized with COVID-19
2. Describe the prevalence of functional disability in a cohort of hospitalized patients diagnosed with COVID-19

Introduction

- COVID-19 has had a significant impact on the US Healthcare system [1]
- Racial & Ethnic minorities experience greater severity of disease & complications [2-4]
- Insurance status can impact health services [5-6]
- Physical function predicts important clinical outcomes in hospitalized patients [7-8]
- Activity Measure for Post Acute Care (AM-PAC) is one measure of physical function
- Minimally Clinical Important Difference (MCID) can offer insight to treatment response [9-10]

Methods

- Retrospective analysis of inpatient COVID-19 Registry at large urban hospital (UPHS IRB #843920)
- **Inclusion Criteria:**
  - Admitted 3/1/20 – 4/31/21; tested + for COVID-19; and had at least 2 AM-PAC Activity scores documented by an Occupational Therapist
- **Outcome Variable**:
  - Improvement or no-change/got worse
  - Based on AM-PAC MCID
- **Covariates:**
  - Demographic: Age, Sex, Race, Ethnicity, Insurance
  - Clinical: Intensive Care Unit (ICU) Admission, Use of Mechanical Ventilation (MV), Charlson Comorbidity Index (CCI), Body Mass Index (BMI)
- **Analysis**
  - Descriptive Statistics
  - Logistic Regression



Results

- **Table 1** presents subject characteristics; Almost 70% of the sample showed no change or got worse on their AM-PAC score
  - Of those who improved: more likely to be younger, male, black, non-Hispanic, have a longer length of stay, less comorbidities, and were more likely to be in the ICU and require MV

Table 1: Subject Characteristics

	No Change/ Got Worse (n = 394)	Improved (n = 171)	p value
Age (y), median (IQR)	68 (60, 67)	60 (52, 73)	<.001
Sex (female), n (%)	205 (52%)	83 (48%)	.446
Race, n (%)			.008
White	139 (35.2%)	49 (28.6%)	
Black	216 (54.8%)	92 (53.8%)	
Ethnicity, n (%)			.235
Non-Hispanic	378 (95.9%)	157 (91.8%)	
Insurance, n (%)			.128
Medicare	233 (59.1%)	69 (40.3%)	
Private	112 (28.4%)	50 (29.2%)	
Medicaid	36 (9.1%)	43 (25.1%)	
LOS, median (IQR)	12 (7, 22)	19 (10, 36)	<.001
CCI, median (IQR)	5 (3, 8)	4 (2, 6)	<.001
BMI, median (IQR)	30.3 (23.7, 34.0)	30.5 (25.8, 37.1)	.008
ICU Admit, n (%)	203 (51.5%)	118 (69%)	<.001
MV, n (%)	99 (25.1%)	82 (47.9%)	<.001

- **Table 2** presents logistic regression output; overall model statistically significant
  - Insurance status, use of Mechanical Ventilation, and CCI all were statistically significant

Table 2: Logistic Regression

	B	S.E.	Wald	df	Sig	Exp (B)	95% CI Lower	95% CI Upper
Sex	.298	.207	2.060	1	.151	1.345	.897	2.016
White Race			1.821	2	.402			
Black Race	.082	.228	.129	1	.719	1.086	.694	1.697
Other Race	.505	.376	1.805	1	.179	1.658	.793	3.465
Ethnicity	-.766	.592	1.672	1	.196	.465	-.146	1.484
Medicaid					<.001			
Medicare	-1.175	.300	15.392	1	<.001	.309	.172	.555
Private	-1.133	.316	12.856	1	<.001	.322	.173	.598
Other	-.644	.522	1.522	1	.217	.525	.189	1.461
ICU Admission	.210	.259	.654	1	.419	1.233	.742	2.049
Mechanical Ventilation	.654	.258	6.434	1	.011	1.923	1.160	3.189
CCI	-.087	.032	7.184	1	.007	.917	.861	.977
BMI	.014	.011	1.617	1	.203	1.014	.993	1.036
Constant	-.466	.532	.767	1	.381	.628		

- **Table 3** presents overall functional outcomes between groups; for those who improved:
  - Had longer timeframe till initial OT evaluation
  - Had more inpatient sessions
  - Median improvement of 5 points on their AM-PAC

Table 3: Functional Outcomes

	No Change/Got Worse (n = 394)	Got Better (n = 171)	p value
Days to initial evaluation, median (IQR)	3 (1, 5)	5 (2, 15)	<.001
Number of OT sessions, median (IQR)	3 (2, 5)	5 (3, 8)	<.001
First AM-PAC Score, median (IQR)	17 (14, 19)	12 (9, 16)	<.001
Final AM-PAC Score, median (IQR)	16 (13, 19)	19 (15, 21)	<.001
Delta AM-PAC, median (IQR)	0 (-1, 1)	5 (3, 7)	<.001
Discharge Home, n (%)	177 (58.80%)	84 (54.54%)	.221

Conclusion & Future Implications

- Patients hospitalized with COVID-19 demonstrate significant functional decline
- Compared to those with Medicaid insurance, the odds of getting worse or having no change in functional status is about half for those with Medicare.
- **Strengths:**
  - Large sample representing urban population
- **Limitations:**
  - Single center reporting
  - No direct measure of COVID-19 severity
  - Missing demographic and clinical data
- Additional evidence to suggest that insurance status may play an important role in outcomes for hospitalized patients with COVID-19
- Impact of comorbidities and disease severity offer a signal for further exploration for this unique patient population

References available upon request

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