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BRIEF REPORT

Clinical Outcomes of Coronavirus Disease 2019 With Evidence-based Supportive Care

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Calls for adherence to evidence-based medicine have emerged during the initial wave of the COVID-19 pandemic but reports of outcomes are lacking. This retrospective study of an institutional cohort including 135 patients with confirmed COVID-19 demonstrates positive outcomes when organizational standards of care consist of evidence-based supportive therapies.

Keywords. COVID-19 outcomes; supportive care; evidence-based medicine.

Since the emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1, 2] and the subsequent coronavirus disease 2019 (COVID-19) pandemic, the publication of scientific data regarding clinical outcomes has been rapid, but with contrasting practice standards. For the bedside clinician, determination of optimal care has been complicated by the various standards presented that, to date, have been either unreported in publications or a combination of investigational antivirals, antibiotics, immune globulins, and immunomodulatory medications [3, 4], each cohort complicated by varying local case fatality rates that range from 0.1% in Denmark to 6.8% in Italy [5, 6]. Due to confounding by these variables, the benefits and harms of individual therapies remain largely unknown. Following widespread use of therapeutic agents with limited data to support their use, calls were made to focus on the evidence-based care that has been the foundation of modern medical therapy for most acute respiratory viral infections [7, 8]. Our study is the first report of COVID-19 outcomes when institutional standards of care consist solely of known evidence-based practices of supportive care.

METHODS

This retrospective, observational case series included all symptomatic patients diagnosed with SARS-CoV-2 by reverse-transcriptase polymerase chain reaction (RT-PCR) at a single military community hospital in Virginia. Cases diagnosed between 6 March 2020 and 22 April 2020 were included. Availability of tests allowed liberal testing strategies, and patients with minimal symptoms were included. No therapeutic trials were available, and institutional policies led to a nonuse of all investigational therapies, including expanded use of antivirals, off-label use of antiinflammatory medications, empirically therapeutic anticoagulation protocols, and investigational devices. Antibiotics were prescribed according to the attending physicians' clinical judgment, and thromboprophylaxis with low-molecular-weight heparin was prescribed based on risk stratification using the Padua prediction score. Disease severity was classified according to historical methods [2], and patients with only subjective dyspnea were managed as outpatients if living conditions were appropriate. The intensive care unit (ICU) transfer policy included those who required ≥5 L of oxygen support. Airway management was based on usual factors and clinical judgment; an explicit "early intubation" strategy was not pursued.

RESULTS

All patients were screened for signs or symptoms compatible with COVID-19 [2]. We tested 1099 patients using RT-PCR, including 75 inpatients, and 135 (12.3%) tested positive. Of those, 88 (65.2%) were male, 54 (40%) were active-duty, and the median age was 46.5 years (interquartile range [IQR], 33–56; Table 1). Two pediatric patients were diagnosed with COVID-19 and fully recovered as outpatients. Data on comorbidities was available for all but 2 of our patients, and those reported were typical of chronic health conditions seen in a community hospital. Incidence of coronary artery disease, chronic kidney, liver disease, and significantly immunocompromised patients each represented less than 5% of our population, whereas obesity, hypertension, and diabetes represented 37%, 25.2%, and 10.4%, respectively. Of those diagnosed with COVID-19, 21 (15.6%) had severe enough disease to necessitate hospitalization and 6 (4.4%) required care in the ICU. Among inpatients, 14 (66.7%) received antibiotics for community-acquired pneumonia, including 11 (52.4%) with azithromycin, all of which had radiologic findings consistent with acute pulmonary infiltrates. Due

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Table 1. Characteristics and Outcomes of Patients

Characteristic				
Baseline Demographic	All, no. (%)	Outpatient, no. (%)	Inpatient, no. (%)[a]	ICU, no. (%)
Total, no. (%)	135	114 (84.4)	15 (11.1)	6 (4.4)
Median age (interquartile range), y	46.5 (33 – 56), (range 1–84)	43 (30.5–55)	50.5 (41.2–58)	52 (39.3–58)
Male	88 (65.2)	72 (63.2)	12 (80)	4 (66.6)
Active-duty	54 (40)	45 (39.5)	7 (46.7)	2 (33.3)
White	52 (38.5)	47 (41.2)	4 (26.7)	1 (16.7)
Black	31 (23.0)	22 (19.3)	5 (33.3)	4 (66.6)
Other/Unreported	50 (37)	43 (37.7)	5 (33.3)	2 (33.3)
Comorbidities				
Obesity, no. (%)	50 (37.0)	40 (35.1)	7 (46.7)	4 (66.7)
Hypertension, no. (%)	34 (25.2)	23 (20.2)	8 (53.3)	4 (66.6)
Diabetes, no. (%)	14 (10.4)	11 (9.6)	2 (13.3)	1 (16.7)
Chronic pulmonary disease, no. (%)	11 (8.1)	8 (7)	2 (13.3)	1 (16.7)
Obstructive sleep apnea, no. (%)	18 (13.3)	15 (13)	2 (13.3)	1 (16.7)
Tobacco use, no (%)	14 (10.4)	12 (10.5)	1 (6.7)	1 (16.7)
Prior tobacco use, no (%)	13 (9.6)	13 (11.4)	0	0
Radiographic imaging				
Chest X ray obtained, no. (%)	23 (17)	14 (12.3)	5 (33.3)	4 (66.7)
Lobar disease	6 (26.1)	4 (28.6)	2 (40)	0
Multifocal disease	11 (47.8)	4 (28.6)	3 (60)	4 (100)
Chest CT obtained, no. (%)	15 (11.1)	2 (1.8)	10 (66.7)	3 (50)
Lobar disease	2 (13.3)	1 (50)	1 (20)	0
Multifocal disease	13 (86.7)	1 (50)	9 (90)	3 (100)
Outcomes by age				
Age range, y	All, no. (%)	Outpatient, no. (%)[b]	Inpatient (%)[b]	ICU, no. (%)[b]
0–19	2 (1.5)	1 (50)	1 (50)	0
20–29	27 (20)	27 (100)	0	0
30–39	26 (19.4)	22 (84.6)	2 (7.7)	2 (7.7)
40–49	24 (17.78)	19 (79.2)	4 (17.4)	1 (4.3)
50–59	32 (23.7)	27 (79.4)	5 (14.7)	1 (3.1)
60+	24 (17.78)	18 (75)	3 (12.5)	2 (8.3)

Abbreviations: ICU, intensive care unit.

[a]Inpatients not requiring ICU-level care.
[b]Percentage of age group.

to a preexisting health system policy, 2 of these patients who were intubated in the emergency department were transferred for mandated cohorting of all intubated COVID patients at the local tertiary care hospital. Both of these patients survived after prolonged ICU stays and having received multiple investigational treatments in addition to supportive care. Four patients were managed in our ICU, 3 of whom required support via high-flow nasal cannula (30–40 L/min; 60%–100% fraction of inspired oxygen), with an average length of ICU stay of 6.5 days. Patients treated in our ICU had median peak C-reactive protein of 18.7 mg/dL (IQR, 12.1–21.2), ferritin of 2981 ng/mL (IQR, 1040.5–3405), and a mean D-dimer of 2.66 μg/mL.

At the time of manuscript preparation, all patients had been discharged from the hospital except 1 who, despite clinical stability, requires continued hospitalization only for infection-control purposes. No investigational therapies were prescribed in our hospital. Overall, no cases of septic shock or secondary infection were diagnosed, no admitted patients progressed to a level of respiratory failure that necessitated intubation during their hospital stay, and none died.

DISCUSSION

Our study demonstrates favorable outcomes for patients with mild to moderately severe COVID-19 disease when evidence-based supportive care is considered the institutional standard. The 2 patients who were intubated and transferred both survived after extensive ICU courses. Both received off-label therapeutic agents at the receiving hospital; therefore, our data do not provide any insight regarding supportive-only care in patients on mechanical ventilation. Notably, however, no patient's condition deteriorated sufficiently while an inpatient to necessitate endotracheal intubation, and none died. We believe this is attributable to multiple factors, including a focus on supportive care that is well established to benefit patients and a conservative intubation strategy. Our population likely also benefited from having later occurrence of widespread

community transmission as lessons learned from regions previously affected were incorporated into local care, and care was provided in a facility that was not taxed by an overwhelming surge. Limitations of this study are notable for being retrospective in design, a younger population, and the lack of long-term follow-up data. Future studies of other populations that are treated with only supportive care are needed to evaluate the benefits and harms of investigational therapeutics and their effects against the morbidity and mortality associated with COVID-19.

Notes

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Disclaimer. The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of Fort Belvoir Community Hospital, the Defense Health Agency, Department of Defense, or US Government.

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