Clinical Outcomes of COVID-19 with Evidence-Based Supportive Care

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Abstract

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 a single-institution cohort including 135 patients with confirmed COVID-19 demonstrates positive outcomes when institutional standards of care consist of evidence-based supportive therapies.

Keywords

COVID-19 Outcomes

Supportive Care

Evidence-Based Medicine

Introduction

Since the emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1, 2] and the subsequent 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 which 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 ranging 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 includes 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, including patients with minimal symptoms. No therapeutic trials were available and institutional policies led to a non-use of all investigational therapies, including expanded use of antivirals, off-label use of anti-inflammatory medications, empirically therapeutic anticoagulation protocols, and investigational devices. Antibiotics were prescribed according to the clinical judgement of the attending physicians and thromboprophylaxis with low molecular weight heparin was prescribed based on risk stratification with 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.

Intensive Care Unit (ICU) transfer policy included those requiring ≥5 liters 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 by 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 [IQR 33 to 56] (Table 1). Two pediatric patients were diagnosed with COVID-19 and fully recovered as outpatients. Data on comorbidities was available for all but two of our patients and those reported were typical of chronic health conditions seen in a community hospital. Incidence of coronary artery disease, chronic kidney and liver disease, and significantly immunocompromised patients each represented less than 5% of our population, whereas obesity, hypertension, and diabetes represented 37%, 25.2%, 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 to a pre-existing health system policy, two 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 which required support via high-flow nasal cannula (30-40 LPM; 60-100% FiO2), with an average length of ICU stay of 6.5 days. Patients treated in our ICU had median peak CRP 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 mcg/mL. At the time of manuscript preparation, all patients have been discharged from the hospital except one who despite clinical stability requires continued hospitalization only for infection control purposes. No

investigational therapies were prescribed in our hospital and overall no cases of septic shock or secondary infection were diagnosed, no admitted patients progressed to a level of respiratory failure necessitating intubation during their hospital stay, and none expired.

Discussion

Our study demonstrates favorable outcomes for patients with mild to moderately severe COVID-19 disease when evidence-based supportive care was considered the institutional standard. The two patients who were intubated and transferred both survived after extensive ICU courses. Both received off-label therapeutic agents at the receiving hospital and therefore our data does not provide any insight regarding supportive-only care in patients on mechanical ventilation. Notably, however, no patient's condition deteriorated sufficiently while 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 able to be 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. Further 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.

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Disclaimer

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Conflicts of Interest

The authors of this study report no financial conflicts of interest.

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Table 1. Characteristics and Outcomes of Patients

Characteristic				
Baseline Demographic	**All - no. (%)**	**Outpatient - no. (%)**	**Inpatient - no. (%)***	**ICU - no. (%)**
Total - no. (%)	135	114 (84.4)	15 (11.1)	6 (4.4)
Median age (IQR) - yr	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)
Caucasian	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)
Co-morbidities				
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 (years)	All - no. (%)	Outpatient - no. (%)**	Inpatient (%)**	ICU - no. (%)**
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)

* Inpatients not requiring ICU-level care

** Percentage of age group