

# Management and outcomes of patients hospitalized with severe COVID-19 at a tertiary care center in midwestern United States

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## Abstract

Knowledge of treatment regimens and outcomes for novel coronavirus disease 2019 (COVID-19) is evolving. Recent studies have reported mortality rates ranging from 39-50% among hospitalized patients with COVID-19. We report our experience of management and outcomes of hospitalized patients with COVID-19 at a large tertiary-care center in Midwestern United States. Of 658 patients presenting to our tertiary care center, 217 needed hospitalization, majority (77%) of whom were severely sick requiring admission to the intensive care unit (ICU). All received corticosteroids, and 78% of the patients received tocilizumab. More than two-thirds of the patients received anticoagulation and 80% of patients in the ICU had prone-positioning. The median duration of hospitalization was 12 days (interquartile range, 8 to 16), median duration of intensive care unit stay was 7 days (interquartile range, 5 to 9) and requirement of mechanical ventilation was 6 days (interquartile range, 5 to 8) in our cohort. Of the 217 patients, 27 died (12% mortality).

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The majority of our patients received corticosteroids, tocilizumab, anticoagulation and prone positioning. While higher mortality rates of >30% have been reported in various studies among hospitalized patients with COVID-19, the majority of hospitalized patients in our cohort survived with a low mortality rate.

Dear Editor,

We are in the midst of an unprecedented COVID-19 global pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) with increasing number of cases and mortality across the world with 24,854,140 confirmed cases and 838,924 deaths globally according to the World Health Organization (WHO) as of August 30, 2020 [1]. In the United States, there have been 5,934,824 cases and 182,149 deaths [2]. Given the unprecedented magnitude of impact of COVID-19 on public health, reporting of treatment regimens and clinical outcomes are needed to understand optimal therapeutic approaches for management of this novel viral disease.

In two recent studies from the United States, mortality rates ranging from 39%-50% in hospitalized patients with COVID-19 have been reported [3,4]. These studies have also reported a median duration of hospitalization of 17 days, ICU stay of 14 days and a median duration of mechanical ventilation ranging from 10-18 days [3,4]. In one of the studies with an overall mortality rate of 39%, 72% patients were reported to receive hydroxychloroquine, 9% received remdesivir, 26% patients received corticosteroids and 17% received IL-6 receptor antagonists [4].

We would like to report our experience of management and clinical outcomes of patients hospitalized with positive SARS COV-2 testing between April 14, 2020 to July 21, 2020 at a large tertiary-care center in Midwestern United States, serving the tristate area of Iowa, South Dakota and Nebraska, that has been a hotspot for COVID-19 due to meat-packaging industries in the vicinity.

Of the 658 patients presenting with COVID-19 to our institution, 217 patients were hospitalized, majority (73%) of whom were non-Hispanic and 51% of the patients were female. The mean ( $\pm$ SD) age of the patients was 54 ( $\pm$ 12) years and the mean Charlson-Deyo risk score was 2.5 ( $\pm$ 0.9).

All (100%) of the hospitalized patients received corticosteroids (24% patients received dexamethasone, 48% methylprednisolone, 28% received prednisolone, respectively). Among other specific therapeutic agents, tocilizumab was utilized in 170 (78%) patients; 48 (24%) patients received remdesivir, 82 (38%) received convalescent plasma and 32 (15%) patients received hydroxychloroquine. Famotidine and vitamin D were used in 43 (20%) and 61 (28%) patients respectively, and 165 (76%) patients required anticoagulation with enoxaparin. Of the hospitalized

patients, 77% (167) needed intensive care, of whom 66% (110) required mechanical ventilation (MV); 30% needed high-flow nasal-cannula and 7 patients received non-invasive ventilation; 80% (134) of ICU patients had prone-positioning, 40% (67) needed vasopressors and 83 (49%) needed inhaled pulmonary vasodilators. The median duration of hospitalization was 12 days (interquartile range, 8 to 16). The median duration of ICU stay was 7 days (interquartile range, 5 to 9) and median duration of MV was 6 days (interquartile range, 5-8) days. Of the 217 patients, 27 (12%) patients died. Of the 658 patients presenting to our center, 95.9% survived with a low mortality rate of 4.1%.

In contrast to previous studies [3,4], most of the hospitalized patients in our cohort received corticosteroids (100%) and tocilizumab (78%) and the majority survived (88%). Moreover, the median duration of hospitalization, ICU stay and mechanical ventilation was lower in our patients. Recently, tocilizumab has been shown to be beneficial in critically ill COVID-19 patients [5], possibly given the presence of cytokine release storm that accompanies severe COVID-19 and dexamethasone has also been shown to reduce mortality in hospitalized patients with COVID-19 as a part of RECOVERY trial results [6], similar to our experience.

The majority of our patients received corticosteroids, IL-6 inhibitor tocilizumab, anticoagulation and prone positioning and we witnessed a lower mortality rate than reported in recent studies among hospitalized patients. These therapeutic strategies may be considered as important components of treatment regimens for severe COVID-19 in hospitalized patients. Reporting of clinical and epidemiologic data is imperative to help understand effective management of this novel viral illness that has become a global

health challenge, and therapies will likely evolve as more scientific evidence becomes available.

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