

Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized With COVID-19 in the New York City Area



In this cohort of COVID-19 inpatients, hypertension and diabetes were over-represented compared to baseline population prevalence. Thus, efforts to reduce hypertension and diabetes through lifestyle may translate into reduced risk of severe COVID-19 clinical outcomes such as hospitalization, mechanical ventilation, and death.

Background Facts:

In 2017-18, the prevalence of obesity in the US was 42.4%. Approximately 45% of US adults have hypertension, and another 9% suffer from type 2 diabetes. Early studies out of China and Italy implicated hypertension and diabetes along with increased age in severe clinical outcomes from COVID-19, including ICU admission and death.

Study Title:

Presenting Characteristics, Comorbidities, and Outcomes Among 5,700 Patients Hospitalized With COVID-19 in the New York City Area.

Hypothesis /Objectives:

To describe the clinical characteristics and outcomes of patients with COVID-19 hospitalized in a US health care system.

Study Design:

5,700 sequentially hospitalized patients with lab-confirmed COVID-19 in 12 New York City area hospitals of the Northwell Health System from March 1 to April 4, 2020.

- Median age 63 years (IQR 52-75 years; range, 0-107 years)
- 39.7% female, 60.3% male
- Race: African American (n=1,230, 22.6%); Asian (n=473, 8.7%); White (n=2,164, 39.8%); Other/multiracial (n=1574, 28.9%)

Outcome Measures:

Clinical outcomes during hospitalization: invasive mechanical ventilation; renal replacement therapy; death.

Summary of Findings:

1. Common comorbidities in the cohort were:

- Hypertension (n=3026, 56.6%); obesity (BMI ≥ 30) (n=1,737, 41.7%); diabetes (n=1,808, 33.8%); morbid obesity (BMI ≥ 35) (n=791, 19%)
- Median Charlson Comorbidity Index score* (IQR): 4 (2-6)

2. Outcomes:

- 373 patients (14.2%) (median age, 68 years, 33.5% female) were treated in the intensive care unit
- 320 (12.2%) received invasive mechanical ventilation
- 81 (3.2%) were treated with renal replacement therapy
- 553 (21%) died

3. No deaths occurred in patients younger than 20 years; mortality rates were higher in male COVID-19 patients compared with female patients at every 10-year age bracket beyond 20 years.



Conclusions:

Older persons, men, and those with pre-existing hypertension and/or diabetes were prevalent in this cohort of patients beyond baseline population representation.

Study Limitations:

- Population restricted to inpatients with COVID-19 in a single US health system servicing the largest metropolitan area of the US; findings may therefore extend poorly to less urban populations or to COVID-19 inpatients in other countries
- Short duration of post-discharge follow-up (median 4.4 days)
- Clinical outcome data available for only 46% of patients (54% remained hospitalized at study end-point)

Single Overriding Communication Objective:

Patients hospitalized with COVID-19 in the New York City metropolitan area had extremely high rates of lifestyle-associated comorbidities including hypertension, diabetes, obesity, and morbid obesity, and overall, 1 in 5 such patients died.

Implications for LM Practice:

Diseases of lifestyle including hypertension and diabetes were over-represented in this large cohort of hospitalized COVID-19 patients; however, rates of obesity appeared to mirror those of the general population. Regardless of disposition from hospital, hospitalization in and of itself should be construed as an adverse event associated with COVID-19. Thus, efforts to reduce population prevalence of hypertension and diabetes, for men, in particular, may translate to COVID-19-specific reductions in hospitalization and healthcare costs.

Associated Indicators

In 5,700 New York City-area inpatients with COVID-19:

- Prevalence of hypertension was 57%
- Prevalence of type 2 diabetes was 34%
- Prevalence of obesity was 42%
- 14% required ICU admission and 12% required mechanical ventilation
- 1 in 5 patients died, with no deaths occurring in those under 20 years of age
- Mortality in men was greater than in women across all age brackets

*Charlson Comorbidity Index predicts 10-year mortality for patients based on age and serious comorbid conditions (e.g., heart disease, cancer). Scores are summed to provide a total score to predict mortality. The median score of 4 corresponds to a 53% estimated 10-year survival and reflects a significant comorbidity burden in this patient population.

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