

was 2 days (range 0-42). Nearly all were categorized as asymptomatic (4.4%), mild (50.9%), or moderate (38.8%) severity, leaving only 5.9% as severe or critical. Looking at breakdown by age, infants made up the highest proportion of severe or critical disease (32%) with preschool ages (1-5 years) next with 28.8%. Half (7) of the 13 critical patients were under 1 year old. No significant differences were seen between male or female patients. There was one death in the sample: a 14-year old boy.

Limitations included lack of clinical characteristics, as only data from the Chinese CDC was used rather than electronic medical records from individual patients. Additionally the majority of cases were suspected, not confirmed, and some of the children remained hospitalized at the end of the study therefore severity of disease may not be accurate. The authors concluded that COVID-19 caused infection in all ages without obvious gender differences, however younger children appeared to have higher severity of disease.

[Carly Eastin, MD

Travis Eastin, MD, MS

University of Arkansas for Medical Sciences, Little Rock, AR]

Comment: This is the largest cohort of pediatric COVID-19 patients to date. This study is based on the China CDC dataset and is limited to the variables that are reported to the CDC. We cannot assume children in the United States will be affected similarly. Overall, this dataset suggests that critical disease is rare in children with COVID-19. Emergency physicians should use caution with infants and young children, however, as they appear to be at highest risk of severe disease and may need closer observation in the emergency department or inpatient admission.

□ RISK FACTORS ASSOCIATED WITH ACUTE RESPIRATORY DISTRESS SYNDROME AND DEATH IN PATIENTS WITH CORONAVIRUS DISEASE 2019 PNEUMONIA IN WUHAN, CHINA.



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Presenting symptoms of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) typically include fever, dyspnea, myalgia, and cough. Previous data suggest that older adults tend to have more severe illness. This study reports characteristics of and potential risk factors for patients who developed acute respiratory distress syndrome (ARDS) or who died as a result of SARS-CoV-2, the virus that causes COVID-19.

Patients aged 21 to 83 who had confirmed COVID-19 and were admitted to Jinyintan Hospital in Wuhan, China between December 25, 2019 and January 26, 2020 were included in this retrospective study. Trained clinicians abstracted data through February 13, 2020 and included epidemiological data, clinical characteristics, laboratory and radiologic findings, treatments, and outcomes. All patients had confirmed SARS-CoV-2 by throat swab sampling. Older age was defined as over 65 years old and fever was defined as a temperature higher than 37.3 degrees Celsius. The primary outcomes were development of ARDS or death among patients with ARDS.

A total of 201 patients met inclusion criteria. The median age was 51 (IQR 43-60), with 19.9% of patients aged 65 years or older. Major comorbidities included hypertension (19.4%), diabetes (10.9%), and cardiovascular disease (4.0%). The most common presenting symptoms were fever (93.5%), cough (81.1%), productive cough (41.3%), dyspnea (39.8%), or fatigue/myalgia (32.3%). Most (95%) had bilateral infiltrates on chest imaging. A separate respiratory viral panel was tested on 173 patients, but only 1 had a coinfection (Influenza A). Notable abnormal laboratory values included lymphocytopenia in 64%, elevated LDH (>150U/L) in 98%, elevated high sensitivity C-reactive protein (> 5mg/L) in 85.6%, elevated erythrocyte sedimentation rate (>15 mm/h) in 93.8%, and elevated d-dimer (>1.5ug/mL) in 23.3%, among others. Once admitted, 82% of patients required oxygen. The majority (48.8%) of patients were on nasal cannula, but many (30.3%) required noninvasive ventilation. Six patients were intubated and 1 of those was also treated with extracorporeal membrane oxygenation (ECMO). Most received antibiotics and antivirals (97.5% and 84.6%, respectively), half (52.7%) received antioxidant therapy, and systemic steroids were given to 30.8%. At the end of the study, 144 (71.6%) patients had been discharged and median length of stay was 13 days (IQR 10-16 days). A total of 44 patients (21.9%) died, all of whom had developed ARDS. The remainder of the patients remained hospitalized.

In comparing patients with (84, 41.8%) or without ARDS, those with ARDS were older (mean difference 12 years, 95% CI [8-16]), more likely to have comorbidities like hypertension or diabetes (differences 13.7%, 95% CI [1.3%-26.1%] and 13.9%, 95% CI [3.6%-24.2%], respectively) and more likely to present with dyspnea (difference 33.9%, 95% CI [19.7%-48.1%]). Other findings more likely to occur in patients with ARDS included lymphocytopenia, neutrophilia, elevated liver or renal measurements, and elevated inflammatory markers. Of those with ARDS who subsequently died, these patients were older (difference 18 years, 95% CI [13-23]), had lower temperatures (difference in proportion of high fever -31.8%, 95% CI [-56.5% to -7.1%]), and received antivirals less often (difference -40.7%, 95% CI [-58.5% to -22.9%]). Additionally, they had even greater abnormalities of liver and renal function, inflammatory markers, or coagulation indices than those with ARDS who survived. High fever (>39°C) was found to be positively associated with developing ARDS (HR 1.77, 95% CI [1.11-2.84]) but was negatively associated with death (HR 0.41, 95% CI [0.21-0.82]) as was treatment with systemic steroids (HR 0.38, 95% CI [0.20-0.72]).

The authors concluded that major risk factors for ARDS and subsequent death were older age, neutrophilia, and evidence of end-organ damage. Comorbidities and fever appeared to be associated with ARDS but not death. Limitations included selection bias, as only patients with severe COVID-19 were hospitalized therefore poor outcomes may appear inflated.

[Carly Eastin, MD

Travis Eastin, MD, MS

University of Arkansas for Medical Sciences, Little Rock, AR]

Comment: This is a large dataset in the limited nascent SARS Co-V2/COVID-19 literature, and, though it should be

interpreted with caution, it does provide some valuable guidance. This study is consistent with other data that those of increased age and with comorbid conditions have worse outcomes than younger, healthier patients. Interestingly, it appears some of those with ARDS did not receive mechanical ventila-

tion, which brings the generalizability of these results into question. Antivirals and corticosteroids may have a role in treatment of patients with ARDS related to COVID-19, but this contradicts many other recommendations to avoid corticosteroids. More research is needed.