COMMENTARY

Preparing Acute Care Facility and a Hospital for COVID-19 Pandemic

Udit Chaddha¹, Viren Kaul², Abhinav Agrawal³

Keywords: COVID-19, Critical care, ICU mortality, Intensive care, Mortality.

Indian Journal of Critical Care Medicine (2020): 10.5005/jp-journals-10071-23435

The coronavirus disease 2019 (COVID-19) pandemic is stressing our healthcare system in an unprecedented manner with physicians having to consider allocation of ventilators, medications, and other essential resources. In these times, appropriate assessment of morbidity and mortality of the SARS-CoV-2 infection is crucial. Reporting the overall case fatality rate (CFR) for COVID-19 is challenging given that the epidemic is still rapidly evolving (therefore, in a disease with a long incubation period, the number of cases at the current time will be larger than a few weeks prior) and the lack of widespread testing leads to underdiagnosis. Both these factors lead to an overestimation of the overall CFR.

During a novel pandemic, the need for data warrants accelerated publications, often without prolonged patient follow-up. This, especially in the intensive care unit (ICU), with the prolonged length of critical illness in patients with COVID-19, makes following up every patient until death or discharge challenging. In addition, these mortality rates can change depending upon the subjects studied and the treatment they receive. Therefore, when mortality rates are reviewed, they need to be put in context to the time and place of assessment. In contrast to the overall CFR, in the ICU, we can have a problem of mortality underestimation. While we have the ability to detect almost every case in the ICU (depending upon test sensitivity), it is challenging to report accurate mortality rates based on interim data from studies that include patients who are currently sick and may eventually die of the disease.

In a retrospective case series of 1,591 critically ill patients infected with SARS-CoV-2 by Grasselli et al.,¹ from Italy, the overall mortality was 26% (405/1581). Given that the median length of ICU stay for patients discharged from the ICU was 8 days (5–12), and that 58% of the patients, despite a minimum follow-up of 7 days, were still in the ICU at the end of their follow-up period (March 25, 2020), there is a concern that the overall mortality is much higher than 26%, as many of these patients will eventually die. Other studies, though much smaller, have reported mortality rates from 17 to 62% in patients admitted to the ICU. However, in these studies too, 12–38% of the study population continued to be in the ICU at the end of their respective follow-up periods (Table 1).¹–⁸

Table 1: Studies assessing mortality in critically ill patients with SARS-CoV-2

<table>
<thead>
<tr>
<th>Study</th>
<th>Date published</th>
<th>Location</th>
<th>n</th>
<th>Mortality</th>
<th>Discharged from ICU</th>
<th>In the ICU at end of follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goyal et al., NEJM, 2020¹</td>
<td>April 17, 2020</td>
<td>New York, USA</td>
<td>130</td>
<td>15% (19)*</td>
<td>23</td>
<td>68% (88)</td>
</tr>
<tr>
<td>Wang et al., ARJCCM, 2020²</td>
<td>April 8, 2020</td>
<td>Wuhan, China</td>
<td>344</td>
<td>39% (133)</td>
<td>54% (185)**</td>
<td>7% (26)**</td>
</tr>
<tr>
<td>Grasselli et al., JAMA, 2020³</td>
<td>April 6, 2020</td>
<td>Lombardy, Italy</td>
<td>1581</td>
<td>26% (405)</td>
<td>16% (256)</td>
<td>58% (920)</td>
</tr>
<tr>
<td>Bhatraju et al., NEJM, 2020⁵</td>
<td>March 30, 2020</td>
<td>Seattle, USA</td>
<td>24</td>
<td>50% (12)</td>
<td>38% (9)</td>
<td>12% (3)</td>
</tr>
<tr>
<td>Arentz et al., JAMA, 2020⁶</td>
<td>March 19, 2020</td>
<td>Washington state, USA</td>
<td>21</td>
<td>52% (11)</td>
<td>10% (2)</td>
<td>38% (8)</td>
</tr>
<tr>
<td>Zhou et al., Lancet, 2020⁷</td>
<td>March 11, 2020</td>
<td>Wuhan, China</td>
<td>50</td>
<td>78% (39)</td>
<td>22% (11)</td>
<td>12% (3)</td>
</tr>
<tr>
<td>Yang et al., Lancet Respiratory Medicine, 2020³</td>
<td>February 24, 2020</td>
<td>Wuhan, China</td>
<td>52</td>
<td>62% (32)</td>
<td>15% (8)**</td>
<td>23% (12)**</td>
</tr>
<tr>
<td>Wang et al., JAMA, 2020⁴</td>
<td>February 7, 2020</td>
<td>Wuhan, China</td>
<td>36</td>
<td>17% (6)</td>
<td>53% (19)</td>
<td>30% (11)</td>
</tr>
</tbody>
</table>

¹Division of Pulmonary, Critical Care and Sleep Medicine, Icahn School of Medicine at Mount Sinai, New York, USA
²Department of Pulmonary and Critical Care Medicine, Upstate Medical University, Syracuse, New York, USA
³Department of Medicine, Section of Pulmonary and Critical Care, The University of Chicago Medicine, Chicago, Illinois, USA
⁴Conflict of interest: None

How to cite this article: Chaddha U, Kaul V, Agrawal A. Preparing Acute Care Facility and a Hospital for COVID-19 Pandemic. Indian J Crit Care Med 2020;24(6):383–384.

Source of support: Nil
We may not realize the true mortality of SARS-CoV-2 until this pandemic is over. But to allow physicians around the globe to better understand both the morbidity and mortality in patients with COVID-19, it is essential that the future studies report their follow-up data on all patients. Also, the published studies with interim data reported should provide a follow-up for us to assess the true CFR. In a study by Zhou et al.\(^1\) \((n = 50)\), where all patients were followed for their complete length of stay, the mortality rate was noted to be significantly higher, at 78%. Another example of longer follow-up yielding more accurate mortality data on a large subset of their population is the study by Wang et al.\(^2\) \((n = 344)\), wherein the authors report outcomes at 28 days. In this study, the mortality was 42% \((133/318)\) in the 92.5% of patients who had a definitive outcome (discharge or death).

It is thus essential that all future studies either comment on the mortality of only those patients who have had adequate follow-up (i.e., until discharge or death) or provide follow-up data for patients still admitted to the hospital. Until then, it is imperative that the mortality data from interim studies should be interpreted with caution.

**Disclosure Statement**

This paper, including any part of it, has not been published elsewhere and is not under consideration for publication elsewhere. All authors read and approved the final draft and give permission to the journal to use any material from the paper if it should choose to publish it.

**References**