

## Behind the Fire in the COVID Wards: A Proposition

Sir,

The COVID-19 pandemic has posed many fresh challenges for the health sector, especially in resource limited regions of the world. When a battle of this proportion is taken up head on by an unprepared system, there is a possibility of overlooking at least a few pertinent aspects which can sometimes prove to have far reaching consequences. There have been a few instances of fire breaking out in COVID-19 centers in both wards and intensive care units (ICUs) across the country and abroad during the past several months.<sup>[1-3]</sup> Several precious lives were lost in these unfortunate incidents while many sustained serious injuries. This letter examines a plausible and potentially remediable cause for these fire outbreaks. There have been rare reports of fire breaking out in a hospital in the past but in the COVID era, the frequency has exponentially risen which definitely calls for a diligent search into the root cause.

Although most patients with the infection are asymptomatic or having mild symptoms, among those requiring admission, respiratory symptoms are at the forefront with a third of them requiring some form of respiratory support.<sup>[4,5]</sup> The classic pathology in the lung in COVID-19 is more or less similar to acute respiratory distress syndrome. Microthrombi can also be seen in the pulmonary circulation.<sup>[6]</sup> Cardiovascular injury in the form of myocarditis or coronary insufficiency may also coexist in some of them.<sup>[7,8]</sup> Hence, a majority of patients admitted to the COVID ICUs and step-down units, and even in the wards may be on oxygen support at a rate of 2–4 L/min. Exhaled air normally contains about 16% oxygen in a normal individual. However, when 100% oxygen is used especially in patients with compromised respiratory exchange, the concentration of oxygen in exhaled air will be several folds. A concentration >23.5% in the atmosphere poses risk of flammability. When a large number of patients are on oxygen on a daily basis, an unprecedented scenario created by the pandemic, an otherwise negligible risk becomes substantial. This coupled with poor insulation of wires, spark generating sockets, use of split air conditioning are well recognized causes for fire outbreaks. These system failures are more likely to occur in newly organized COVID facilities especially in resource limited areas. The present surge in usage of oxygen also increases the probability of gas leakage, and the unplanned and unprepared system may lead to more exposure to metallic elements, lubricants, and oil which may serve as fuel for the fire. The root causes for hospital fire remain the

same but the magnitude of the health crisis has accentuated it to an unacceptable degree.<sup>[9]</sup> Therefore, we propose that the room oxygen concentration should be monitored in COVID-19 wards on a regular basis along with all other measures of fire safety to ensure that such events are not repeated in future.

Room oxygen monitors are wall-mounted devices with special sensors which are routinely used in settings where gas leakage is a concern or when compressed gas is used as in laboratory settings. They give off an alarm when the room oxygen falls below 19.5 or when it rises above 23.5%. These devices are cost-effective and can be easily installed in the COVID wards and ICUs.<sup>[10]</sup>

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There are no conflicts of interest.

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