Happy hypoxia: Highlighting a silent COVID 19 killer for better prognostic and pandemic management outcomes in Kenya.

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BACKGROUND

• With the second wave of COVID-19, medical practitioners worldwide and private citizens are experiencing a phenomenon where asymptomatic patients are collapsing and dying spontaneously from Oxygen depletion, without the tell-tale warning sign—Shortness of breath or feeling very unwell. (1,2,5,6)

• Patients present to hospital with severe hypoxemia disproportionate to the severity of their COVID 19 symptoms, with acutely low Oxygen saturation levels (spO2) of ≤ 50%. (2)

• This trend points towards a silent underlying killer symptom of COVID 19: Subclinical hypoxemia
STATEMENT OF THE PROBLEM

• Pathophysiologically, COVID-19 causes a collapse of the alveoli, reducing Oxygen uptake levels without compromising CO2 excretion. The hypercapnic reflex is therefore not stimulated and the patients do not experience Shortness of Breath as they normally should in lung obstruction/dysfunction. This non-manifesting hypoxia is termed sub-clinical hypoxemia. (2,4,5)

• Patients will only experience acute episodes of hypoxia too late with already critical levels of Oxygen saturation.

• Subclinical hypoxia presents a problem to our overburdened resource scarce public health system as it produces numbers of patients, who present to hospital already in critical care, needing high dependency care, (and yet with a higher mortality rate) in an already resource limited setting.

• Failure to detect and treat COVID-19 related hypoxemia delays critical treatment that could prevent deterioration.
Early detection of silent hypoxia is key if COVID 19 ARDS is to be effectively treated.

Patients with very low Oxygen saturation levels are more likely to die, even with mechanical ventilation.

Research has shown that among patients with ARDS, (with an SpO2 of 88-92% ) early exposure to a conservative oxygenation strategy did not increase survival at 28 days. I.e. even with mechanical ventilation, these patients still had a higher mortality rate than their counterparts with SpO2 of ≥ 96% (5)

- Mortality rate for patients with SpO2 in study under conservative Oxygen ventilation, SpO2 of 88-92%: 44.4%
- Mortality rate for patients with SpO2 in study under conservative Oxygen ventilation, SpO2 of ≥96%: 34.4%
- Difference in percentage points between the mortality rate in the two groups of study subjects: 14.0%
CONCLUSIONS AND RECOMMENDATIONS

• COVID 19 manifests as an atypical pneumonia, without suppuration. Its pathophysiologic etiology is by collapsing the alveolar wall, effectively reducing Oxygen uptake, with no effect on CO2 excretion, so that there is no hypercapnia and no subsequent Shortness of breath associated with pneumonia or pulmonary obstruction. This way, this vital symptom, oxygen desaturation can be missed in asymptomatic but high risk populations, catching them too late, at which stage not even ventilation can help.

• There needs to be a higher index of suspicion for Oxygen desaturation in our screenings for COVID-19. Pulse oximeters should be used in screening in high risk populations and areas.
• Pulse oximeters should be used to monitor for deterioration in patients that don’t need hospitalization but who are at high risk of developing serious symptoms.
• Home pulse oximetry, telemonitoring and earlier institution of Oxygen supplementation for hypoxemic COVID-19 patients.
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