Higher prevalence of occult hypoxemia during anesthesia in Black and Hispanic patients

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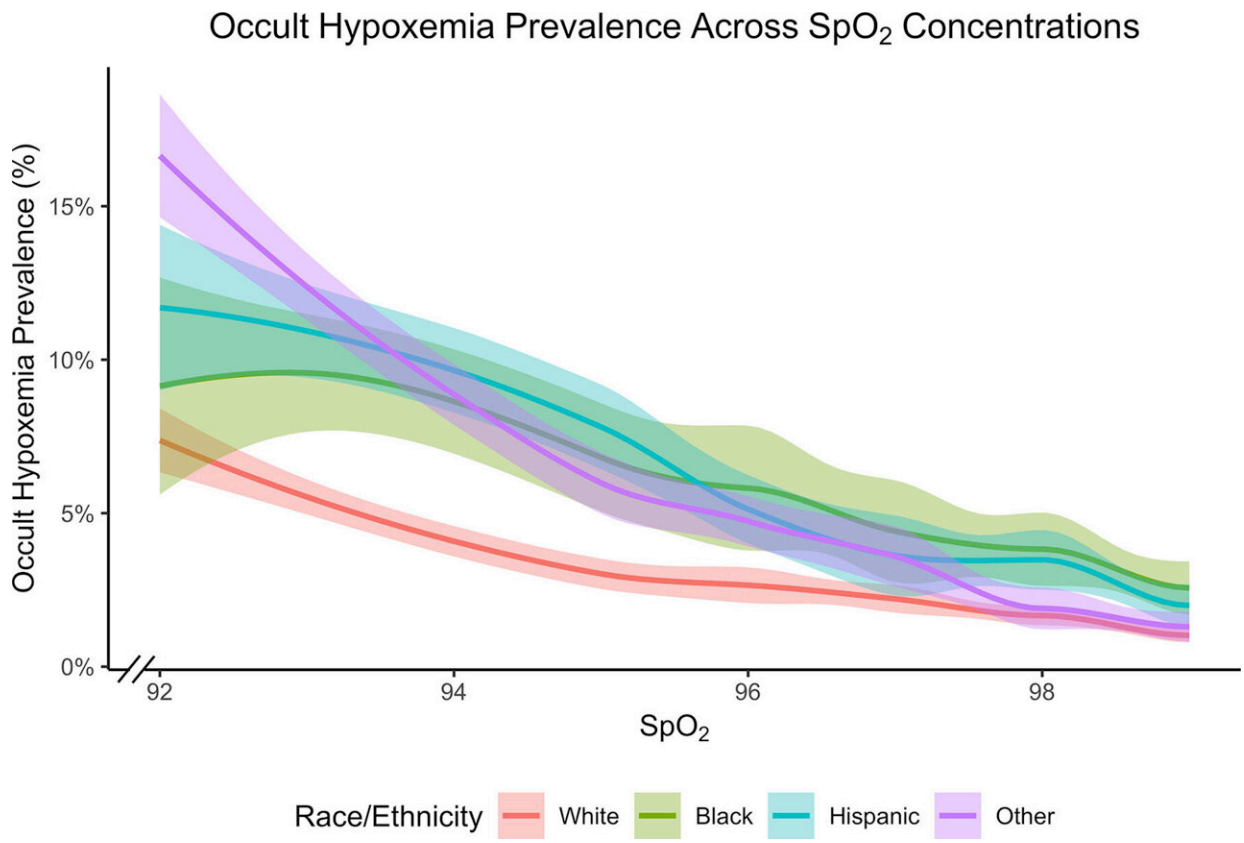

Prevalence of occult hypoxemia (arterial oxygen saturation at less than 88% despite oxygen saturation measured by pulse oximetry [Spo2] being greater than 92%) by self-reported race/ethnicity between mean Spo2 values of 92 to 100%. The curve was generated using the locally weighted scatterplot smoothing method with 50% smoothing to predict the hypoxemia prevalence at a given Spo2 value. Each prediction is derived from fitting a locally linear regression

from the neighboring 50% data points. The shading represents the 95% CI of the locally weighted scatterplot smoothing curve. Credit: *Anesthesiology* (2022). DOI: 10.1097/aln.0000000000004153

Pulse oximeters are among the most commonly used medical devices and a standard intraoperative monitor for patients under anesthesia. Studies have provided mixed results on the impact of dark skin pigmentation on pulse oximeter accuracy, but one recent study demonstrated a higher prevalence of unrecognized low oxygen levels in the blood despite normal pulse oximeter values in hospitalized patients. This has never been investigated in patients under anesthesia, but is important as pulse oximeter values impact patient care, included removal of a breathing tube at the end of surgery or where the patient goes following surgery (e.g., home, recovery room, critical care unit).

Published in *Anesthesiology*, this large, retrospective cohort study evaluated patients at a single center under anesthesia for surgery. All patients who had a measurement of blood oxygenation (e.g., arterial blood gas) during surgery were included in the study and their measured blood oxygen saturation was compared to their pulse oximeter reading at the same time. The primary outcome was occult hypoxemia, or a measured blood oxygen saturation (SaO_2) $_2$) > 92% as stratified by self-reported race/ethnicity. The study found the prevalence of occult hypoxemia to be significantly higher in Black (2.1%) and Hispanic (1.8%) patients when compared to white patients (1.1%), even after adjusting for other patient factors.

Self-reported Black and Hispanic race/ethnicity is associated with a greater prevalence occult hypoxemia when compared to white race/ethnicity.

Demonstrating this discrepancy illustrates that racial/ethnic disparities exist and should be considered when caring for patients of color. Further validation of pulse oximeters in patients of color are required to further address this problem.

Dr. Garrett W. Burnett said, "Previously, discrepancies in pulse oximeter performance in patients of color were thought to be at lower oxygen saturation levels. More recently, including in the present study, evidence for pulse oximeter discrepancies at higher levels in patients of color have been demonstrated. This is a problem with potentially far reaching consequences due to the vital role pulse oximeters play in modern healthcare. Further research to investigate and address this problem is required."

The FDA has issued a safety communication related to this topic. The FDA is reviewing published literature, reviewing premarket data, and working with manufacturers and testing laboratories to better understand this problem:

https://www.fda.gov/medical-devices/safety-communications/pulse-oximeter-accuracy-and-limitations-fda-safety-communication.

More information: Garrett W. Burnett et al, Self-reported Race/Ethnicity and Intraoperative Occult Hypoxemia: A Retrospective Cohort Study, *Anesthesiology* (2022). DOI: 10.1097/aln.0000000000004153

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