Monitoring the oxygen reserve index can contribute to the early detection of deterioration in blood oxygenation during one-lung ventilation.

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BACKGROUND: Hypoxemia can occur during one-lung ventilation (OLV), but monitoring blood oxygenation using percutaneous oxygen saturation (SpO2) can be limited by detection latency, and SpO2 sometimes does not change during OLV. The Oxygen Reserve Index (ORiTM) is a novel index reported to detect impending desaturation before this is observed with SpO2 monitoring. This study assessed whether the ORi decreased earlier than SpO2 during OLV and evaluated its correlation with the partial pressure of arterial oxygen (PaO2) during OLV.
METHODS: The study enrolled 15 patients undergoing elective thoracic surgery. The patient's trachea was intubated with a left-sided double-lumen endotracheal tube and the lungs were mechanically ventilated in pressure-control mode for 10 min, with the fraction of inspired oxygen set at 0.6. Right OLV was then initiated for 15 min or until SpO2 declined to 91%, while continuously recording the ORi and SpO2. PaO2 was measured 5 min before and every 3 min during OLV. Mean (SD) times from the start of OLV to the start of the decreases in ORi and SpO2 were calculated.
RESULTS: ORi started decreasing significantly before SpO2 [ORi vs. SpO2: 171 (102) vs. 372 (231) s; $P<0.01$]. ORi showed a significant, strong correlation with PaO2 ($r2=0.671$, $P<0.01$).
CONCLUSIONS: ORi decreased earlier than SpO2 during OLV. This index could contribute to the early detection of deterioration in blood oxygenation during OLV.