The oxygen reserve index (ORI): a new tool to monitor oxygen Therapy

T. W. L. Scheeren, F. J. Belda, A. Perel
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Abstract

Supplemental oxygen is administered in the vast majority of patients in the perioperative setting and in the intensive care unit to prevent the potentially deleterious effects of hypoxia. On the other hand, the administration of high concentrations of oxygen may induce hyperoxia that may also be associated with significant complications. Oxygen therapy should therefore be precisely titrated and accurately monitored. Although pulse oximetry has become an indispensable monitoring technology to detect hypoxemia, its value in assessing the oxygenation status beyond the range of maximal arterial oxygen saturation (SpO2 ≥97%) is very limited. In this hyperoxic range, we need to rely on blood gas analysis, which is intermittent, invasive and sometimes delayed. The oxygen reserve index (ORI) is a new continuous non-invasive variable that is provided by the new generation of pulse oximeters that use multi-wavelength pulse co-oximetry. The ORI is a dimensionless index that reflects oxygenation in the moderate hyperoxic range (PaO2 100–200 mmHg). The ORI may provide an early alarm when oxygenation deteriorates well before any changes in SpO2 occur, may reflect the response to oxygen administration (e.g., pre-oxygenation), and may facilitate oxygen titration and prevent unintended hyperoxia. In this review we describe this new variable, summarize available data.