Adjustment of oxygen reserve index (ORi™) to avoid excessive hyperoxia during general anesthesia.

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The Oxygen Reserve Index (ORi™) is a non-invasive variable that reflects oxygenation continuously. The aims of this study were to examine the relationship between arterial partial pressure of oxygen (PaO2) and ORi during general anesthesia, and to investigate the usefulness of ORi as an indicator to avoid hyperoxia. Twenty adult patients who were scheduled for surgery under general anesthesia with arterial catheterization were enrolled. After induction of general anesthesia, inspired oxygen concentration (FiO2) was set to 0.33, and arterial blood gas analysis was performed. The PaO2 and ORi at the time of blood collection were recorded. After that, FiO2 was changed to achieve an ORi around 0.5, 0.2, and 0, followed by arterial blood gas analysis. The relationship between ORi and PaO2 was then investigated using the data obtained. Eighty datasets from the 20 patients were analyzed. When PaO2 was less than 240 mmHg (n = 69), linear regression analysis showed a relatively strong positive correlation ($r^2 = 0.706$). The cut-off ORi value obtained from the receiver operating characteristic curve to detect PaO2 ≥ 150 mmHg was 0.21 (sensitivity 0.950, specificity 0.755). Four-quadrant plot analysis showed that the ORi trending of PaO2 was good (concordance rate was 100.0%). Hyperoxemia can be detected by observing ORi of patients under general anesthesia, and thus unnecessary administration of high concentration oxygen can possibly be avoided.