

## 主 論 文

### The Incidence of Desaturation during Anesthesia in Adult and Pediatric Patients: A Retrospective Study

(麻酔導入時の低酸素血症の発生頻度に関する後方視的研究)

#### [Introduction]

The prevention of desaturation is an essential component of anesthesia practice. Previous studies focused mainly on healthy populations, and patients who underwent elective and non-cardiac surgeries, which limit the generalization of their study results. It is important to understand desaturation in all patients.

#### [Materials and Methods]

SpO<sub>2</sub> values and baseline characteristics of pediatric ( $\leq 13$  years old) and adult ( $> 13$  years old) patients who had surgery under general anesthesia from January 1 to December 31, 2014 were assessed. Pediatric and adult patients were divided to hypoxic ( $< 92\%$ ) and nonhypoxic ( $\geq 92\%$ ) subgroup. The outcome of interest was desaturation, defined for the hypoxic patients as a SpO<sub>2</sub> decrease of  $\geq 1\%$  from the starting SpO<sub>2</sub> value, for a minimum of 180 sec. In the nonhypoxic patients, desaturation was defined if a patient's SpO<sub>2</sub> fell to  $< 92\%$  and remained below this level for a minimum of 180 sec. Stratified analysis was used to control for confounders.

#### [Results]

Overall incidence (95%CI) for desaturation was 11.1% (9.4-13.1) in the pediatric patients and 0.9% (0.6-1.2) in the adults. Crude incidence of desaturation in the hypoxic pediatric patients was 2.5 times the risk in the nonhypoxic patients: risk ratio (RR) 2.5 (1.8-3.5),  $p < 0.001$ . Risk of desaturation in the hypoxic adult was 20.1 times the risk in the nonhypoxic adult: RR 20.1 (10.3-39.2),  $p < 0.001$ . When patients were separately stratified by ASA-PS and by age, the directly adjusted risk-ratios (RRs) showed that the hypoxic pediatric patients had 1.8 and 1.6 times the risk compared to the nonhypoxic pediatric patients: ASA-PS adjusted RRs 1.6 (1.8-2.2),  $p < 0.001$ ; age-adjusted RRs 1.8 (1.3-2.5),  $p < 0.001$ , and the hypoxic adult patients had 13.8 times the risk compared to the nonhypoxic adult patients: RRs 13.8 (6.9-27.6),  $p < 0.001$ .

#### [Discussion]

Analysis showed the overall incidence of desaturation was higher in the hypoxic subgroups compared to the nonhypoxic subgroups. ASA-PS was shown in both pediatric and adult data to have an effect modification on desaturation.

#### [Conclusion]

Paying attention to high-ASA-PS status patients and attaching the pulse oximeter probe to check patient's oxygen saturation before start of anesthesia is recommended, as doing so could help estimate the patients' desaturation risk and ensure safety preparations.

キーワード: 全身麻酔、大人、小児、酸素飽度低下、先天性心疾患、パルスオキシメーター。