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SCIENTIFIC LETTER

Oxygen Saturation Index to Predict Surfactant Requirement in Preterm Infants

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To the Editor: In the management of respiratory distress syndrome (RDS), which causes major mortality and morbidity in preterms, surfactant is suggested to avoid invasive mechanical ventilation. The guidelines recommend surfactant according to mean airway pressure (MAP)/positive end expiratory pressure (PEEP) and fraction of inspired oxygen - FiO_2 needs [1, 2]. The oxygenation index (OI) is calculated with MAP, FiO_2, and partial oxygen pressure - PaO_2 and used to access the severity of respiratory failure [3]. The OSI uses oxygen saturation - SpO_2 instead of PaO_2, which is noninvasive and can be measured continuously. The studies found a strong correlation between OSI and OI in neonates [3, 4].

This single-center, retrospective study aimed to predict the surfactant requirement by evaluating OSI. Infants < 30 wk gestational age, who received nasal respiratory support but were not intubated were included. Baseline characteristics and the MAP, FiO_2, and OSI values at admission and before surfactant administration were recorded. For the nonsurfactant group, these values were also recorded at the postnatal sixth hour. The OSI was calculated as following: $OSI = [MAP\ (cmH_2O) \times FiO_2\ (\%)]/SpO_2\ (\%)$ [3].

Of the total 76 newborns, 28 required surfactant. The mean gestational age (GA) and birth weight (BW) were similar. The mean OSI values at admission and before surfactant administration were higher in the surfactant group (3.10 ± 1.10 vs. 1.66 ± 0.46, and 3.98 ± 1.50 vs. 1.62 ± 0.4, $p < 0.001$, respectively). The receiver operating characteristic (ROC) curves for OSI were statistically significant. The cut-off value of OSI at admission to predict surfactant requirement was 1.91 (89% sensitivity, 77% specificity). The OSI value just before surfactant administration was found to be 2.33 with a sensitivity of 93%, and with a specificity of 98% (AUC 0.980; 95% CI: 0.952–1.000, $p < 0.001$). These findings highlight that using OSI could be helpful in making surfactant decisions.

To our knowledge, this is the first study about OSI for predicting surfactant requirements. Prospective validation of these cutoffs in a larger sample size can improve clinical relevance and identify potential differences in cutoffs.

Declarations

Conflict of Interest None.

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