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Introduction: Portable nocturnal oximetry has been shown to be an economic and reliable tool in diagnosing obstructive sleep apnea. The objective of this study is to explore the association of parameters from nocturnal oximetry with postoperative complications in surgical patients.

Methods: Following the approval of Institutional Review Board, patients visiting preoperative clinics for their scheduled surgery were approached for informed consent. Consented patients underwent a preoperative nocturnal oxygen saturation monitoring with a high resolution pulse nocturnal oximetry PULSOX-300i. The oximetry recordings were processed with a computer program (Profox). Cumulative time percentage with SaO2<90% (CT90), Cumulative time percentage with SaO2<80% (CT80), oxygen desaturation index (ODI), mean and lowest SpO2 were extracted. ODI was the hourly desaturation events with SpO2 drop ≥ 4% for ≥ 10 seconds. Adverse events were collected through follow-up by research staff and chart review.

Results: A total of 548 patients were included in this study: 298 (54.4%) females and 250 (46%) males with average age 60 ± 12 years. Orthopedic surgery (52%) was most common, followed by general (20%) and spine (10%) surgeries. Univariate analysis with logistic regression showed that mean SpO2, ODI and CT90 were significantly associated with the occurrence of postoperative complications (p < 0.01). Neither lowest SpO2 nor CT80 was related to complications. The area under receiver operating characteristic curve (ROC) to predict postoperative complication was 0.644 for mean SpO2, 0.588 for ODI and 0.568 for CT90. Based on the highest prediction accuracy, the best cutoff value was 94.4 for mean SpO2, 4.2 for ODI and 1.1 for CT90. The odds ratio at best cut-off was 3.28 (95% CI: 2.28 – 4.72) for mean SpO2 < 94.4 vs SpO2 ≥ 94.4, 1.79 (95% CI: 1.20 – 2.66) for ODI > 4.2 vs ODI ≤ 4.2, and 1.54 (95% CI: 1.07 – 2.22) for CT90 > 1.1 vs CT90 ≤ 1.1. Further analysis showed that desaturation was most common postoperative adverse events (Figure).

Discussion: Mean SpO2, ODI, and CT90 from preoperative nocturnal oximeter were significant indicators for postoperative complications. Preoperative nocturnal oximetry may be useful in stratifying patients for the risk of postoperative adverse events.