Continuous vital sign monitoring after major abdominal surgery—Quantification of micro events

Introduction: Millions of patients undergo major abdominal surgery worldwide each year, and the post-operative phase carries a high risk of respiratory and circulatory complications. Standard ward observation of patients includes vital sign registration at regular intervals. Patients may deteriorate between measurements, and this may be detected by continuous monitoring. The aim of this study was to compare the number of micro events detected by continuous monitoring to those documented by the widely used standardized Early Warning Score (EWS). Methods: Fifty patients were continuously monitored with peripheral arterial oxygen saturation (SpO2), heart rate (HR), and respiratory rate (RR) the first 4 days after major abdominal cancer surgery. EWS was monitored as routine practice. Number and duration of events were analyzed using Fisher’s exact test and Wilcoxon rank sum test. Results: Continuous monitoring detected a SpO2 <92% in 98% of patients vs 16% of patients detected by EWS (P < .0001). Micro events of SpO2 <92% lasting longer than 60 minutes were found in 58% of patients by continuous monitoring vs 16% by the EWS (P < .0001). Fifty-two percent of patients had micro events of SpO2 <85% lasting longer than 10 minutes. Continuous monitoring found tachycardia in 60% of patients vs 6% by the EWS. Frequency of events for bradycardia, tachypnea, and bradypnea showed similar patterns. Conclusion: Very low SpO2 and tachycardia in post-operative patients are common and under-diagnosed by the EWS. Continuous monitoring can discover these micro events and potentially contribute to earlier detection and, potentially, result in prevention of clinical complications.