

采用呼吸量监测仪评估肥胖和非肥胖患者围术期每分钟通气量情况

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背景:

术后患者安全的主要关注点之一是自主呼吸状态。监测呼吸状态对于肥胖患者尤为重要，因为术后呼吸并发症风险更高，并且体重增加导致代谢需要增加。本文采用新型、非侵入呼吸量监测系统 (RVM) 监测肥胖和非肥胖患者围术期通气情况，以便制定更好的监测策略。

方案:

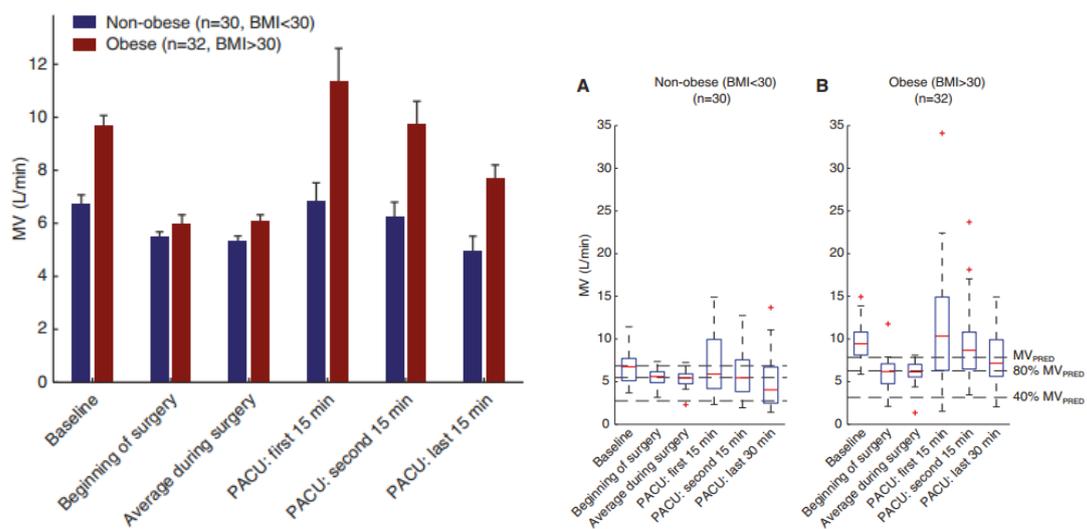
RVM 将传感器置于胸部，收集 62 例全麻下进行关节置换手术患者的呼吸数据。患者分为肥胖组 (BMI \geq 30) 和非肥胖组 (BMI $<$ 30)。围术期各个时间点收集的每分钟通气量 (MV) 和每位患者基于理想体重 (IBW) 和体表面积 (BSA) 得到两个预测值进行比较。MV 测量值分布也在肥胖组和非肥胖组中进行比较。

结果

肥胖患者术前、术中和术后 MV 值均高于非肥胖患者。肥胖患者 MV 测量值远高于依据 IBW 得到的 MV 预测值，而与依据 BSA 得到的 MV 预测值接近。肥胖患者采用标准阿片类药物剂量表现术后 MV 更大的变化性。

结论

研究发现，采用标准阿片药物治疗时，肥胖患者术后通气量变化更加剧烈，尽管整体通气量较高，但其中许多患者仍存在换气不足的风险。在评估肥胖患者呼吸参数时，基于体表面积 (BSA) 的 MV 预测值可能比基于 IBW 的预测值更加合适。呼吸量监测系统 (RVM) 能够为肥胖和非肥胖患者提供持续、非侵入呼吸功能的评估，提供有别于 EtCO₂ 和 SpO₂ 的临床实用数据。



Assessment of Perioperative Minute Ventilation in Obese versus Non-obese Patients with a Non-invasive Respiratory Volume Monitor

Background: Monitoring the adequacy of spontaneous breathing is a major patient safety concern in the postoperative setting. Monitoring is particularly important for obese patients, who are at a higher risk for post-surgical respiratory complications and often have increased metabolic demand due to excess weight. Here we used a novel, noninvasive Respiratory Volume Monitor (RVM) to monitor ventilation in both obese and non-obese orthopedic patients throughout their perioperative course, in order to develop better monitoring strategies.

Methods: We collected respiratory data from 62 orthopedic patients undergoing elective joint replacement surgery under general anesthesia using a bio-impedance based RVM with an electrode PadSet placed on the thorax. Patients were stratified into obese ($BMI \geq 30$) and non-obese cohorts and minute ventilation (MV) at various perioperative time points was compared against each patient's predicted minute ventilation (MV_{PRED}) based on ideal body weight (IBW) and body surface area (BSA). The distributions of MV measurements were also compared across obese and non-obese cohorts.

Results: Obese patients had higher MV than the non-obese patients before, during, and after surgery. Measured MV of obese patients was significantly higher than their MV_{PRED} from IBW formulas, with BSA-based MV_{PRED} being a closer estimate. Obese patients also had greater variability in MV post-operatively when treated with standard opioid dosing.

Conclusions: Our study demonstrated that obese patients have greater variability in ventilation post-operatively when treated with standard opioid doses, and despite overall higher ventilation, many of them are still at risk for hypoventilation. BSA-based MV_{PRED} formulas may be more appropriate than IBW-based ones when estimating the respiratory demand of obese patients. The RVM allows for the continuous and non-invasive assessment of respiratory function in both obese and non-obese patients.