Non-invasive ventilation during surgery under neuraxial anaesthesia: a pathophysiological perspective on application and benefits and a systematic literature review.


Author information

1 Department of Anesthesia, Critical Care and Emergency, Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico, Milan, Italy.
2 Department of Anaesthesiology and Critical Care, All India Institute of Medical Sciences (AIIMS), Raipur, India.
3 Department of Pulmonary and Critical Care Medicine, Hofstra Northwell School of Medicine, Lenox Hill Hospital, New York, NY, USA.
4 Cardiac Anesthesia and Intensive Care Unit, AORN dei Colli - Monaldi Hospital, Naples, Italy.
5 Istanbul University-Cerrahpasa, Cerrahpasa School of Medicine, Department of Intensive Care, Istanbul, Turkey.
6 Medical School, University of Crete Greece, ICU University Hospital of Heraklion, Crete, Greece.
7 Respiratory Diseases Unit, Hospital of Sestri Levante, Sestri Levante, Italy.
8 Respiratory Unit, AORN dei Colli - Monaldi Hospital, Naples, Italy.
9 Department of Pneumology, Hospital Santa Marta, Lisboa, Portugal.
10 Unidad de Cuidados Intensivos, Hospital Punta de Europa, Algeciras, Cádiz, Spain.
11 Department of Anesthesiology and Surgery, University of Rochester, Rochester, New York, USA.
12 Department of Anaesthesiology and Intensive Care Medicine, Pulmonary Engineering Group, University Hospital Carl Gustav Carus, Technische Universität Dresden, Dresden, Germany.
13 Department of Anaesthesia and Critical Care, All India Institute of Medical Sciences (AIIMS), Raipur, India.
14 Department of Respiratory Medicine, Nottingham University Hospitals NHS Trust, Nottingham, United Kingdom.
15 Department of Anesthesia and Critical Care, All India Institute of Medical Sciences (AIIMS),

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RAIPUR, India.
16 Faculty of Medicine, University of São Paulo, São Paulo, Brasil.
17 Department of Anesthesiology, American University of Beirut - Medical Center, School of Medicine, Beirut-Lebanon, Lebanon.
18 Department of Intensive Care Medicine EOC, Ospedale Regionale Bellinzona e Valli, Bellinzona, Switzerland.
19 School of Medicine, The University of Western Australia.
20 Intensive Care Unit, Hospital Morales Meseguer, Murcia, Spain.

Abstract
Unlike general anaesthesia, neuraxial anaesthesia (NA) reduces the burden and risk of respiratory adverse events in the post-operative period. However, both patients affected by chronic obstructive pulmonary disease (COPD) and chest wall disorders and/or neuromuscular diseases may experience the development or the worsening of respiratory failure, even during surgery performed under NA; this latter negatively affects the function of accessory respiratory muscles, resulting in a blunted central response to hypercapnia and possibly in an exacerbation of cardiac dysfunction (NA-induced relative hypovolemia). According to European Respiratory Society (ERS) and American Thoracic Society (ATS) guidelines, non-invasive ventilation (NIV) is effective in the post-operative period for the treatment of both impaired pulmonary gas exchange and ventilation, while the intra-operative use of NIV in association with NA is just anecdotally reported in the literature. Whilst NIV does not assure a protected patent airway and requires the patient's cooperation, it is a handy tool during surgery under NA: NIV is reported to be successful for treatment of acute respiratory failure; it may be delivered through the patient's home ventilator, may reverse hypoventilation induced by sedatives or inadvertent spread of anaesthetic up to cervical dermatomes, and allow the avoidance of intubation in patients affected by chronic respiratory failure, prolonging the time of non-invasiveness of respiratory support (i.e., neuromuscular patients needing surgery). All these advantages could make NIV preferable to oxygen in carefully selected patients.

KEYWORDS: intra-operative respiratory failure; non-invasive ventilation; neuraxial anaesthesia

PMID: 31617693 DOI: 10.5114/ait.2019.88572

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