Noninvasive mechanical ventilation in a patient with acute pancreatitis and respiratory failure

Ventilação mecânica não invasiva em uma paciente com pancreatite aguda e insuficiência respiratória

Armando Carlos Franco de Godoy, Thiago Rodrigues Araújo Calderan, Gustavo Pereira Fraga

To the Editor:

Respiratory failure in acute pancreatitis is one of the prognostic factors for mortality and can lead to death in the first week of treatment. Therefore, much attention has been devoted to the respiratory complications of this condition. The most common pleuropulmonary complications of acute pancreatitis are inflammatory response syndrome, atelectasis, alveolar consolidation, and diaphragmatic dysfunction.[1,2]

Noninvasive mechanical ventilation (NIMV) is an advance in intensive care in specific cases of acute respiratory failure, such as in COPD exacerbation and in cardiogenic pulmonary edema.[3] In such cases, NIMV is used in order to reduce the work of breathing and improve pulmonary gas exchange, as well as to avoid tracheal intubation.[3]

In the Adult ICU of the State University at Campinas *Hospital de Clínicas*, located in the city of Campinas, Brazil, we had the opportunity to treat a 35-year-old female patient who had been admitted with a diagnosis of acute biliary pancreatitis and signs of respiratory failure. The scores obtained were as follows: Simplified Acute Physiology Score II = 30; Ranson scoring system (48 h) = 5.8; and Balthazar CT score = B-C 3, D-E 12. At admission, the patient presented with severe abdominal pain, sweating, dyspnea (RR = 35 breaths/min), contraction of accessory respiratory muscles, nasal flaring, and paradoxical breathing.

The patient received ventilatory support by NIMV for three consecutive days, requiring no endotracheal intubation or invasive mechanical ventilation. She was started on NIMV at 7:30 a.m. on postadmission day 2, NIMV being delivered via a face mask connected to a ventilator (BiPAP Vision; Respironics Inc., Murrysville, PA, USA) set in spontaneous mode. Initially, expiratory positive airway pressure (EPAP) was set at 25 cmH_2O and inspiratory positive airway pressure (IPAP) was set at 12 cmH_2O, oxygen being delivered at 7 L/min via a catheter connected to the ventilator circuit. After the patient's adaptation to the ventilator, the EPAP levels were periodically adjusted to obtain an SaO_2 greater than 94% and the IPAP levels were adjusted to obtain a tidal volume of 5-8 mL/kg and an RR below 30 breaths/min. Weaning from NIMV was achieved after three consecutive days by gradually reducing the EPAP and IPAP levels in order not to increase the RR and reduce the tidal volume and SaO_2. On the fifth day of treatment, the patient received oxygen at 7 L/min via a nebulizer mask, showing no signs of respiratory distress. There was no need for NIMV for the remainder of her hospital stay.

Before starting the treatment with NIMV, the patient was dyspneic because of the presence of bilateral alveolar infiltrates in the lung bases, microatelectasis, and abdominal distension. The last of the three led to a restrictive ventilatory pattern, with a reduction in diaphragmatic strength and mobility, which was due to cephalic displacement of the diaphragm. After the initiation of NIMV, her arterial pO_2 increased and her RR stabilized. On the first day of NIMV, there was clearly an increase in RR (> 40 breaths/min) and a fall in SaO_2 (< 85%) whenever the face mask was removed for oral hygiene, communication, adjustment, or administration of medications.

According to the recommendations of the Third Brazilian Consensus on Mechanical Ventilation, NIMV can be beneficial in cases of hypoxemic respiratory failure; however, caution should be exercised when using NIMV in such patients, because this treatment modality has a grade B recommendation.[3] Ventilatory support by NIMV is safe and efficient as long as patients are closely monitored and promptly intubated if their clinical condition deteriorates; however,

when used incorrectly, NIMV can delay the use of invasive mechanical ventilation and increase mortality.[1,3]

In conclusion, NIMV can be part of the therapeutic armamentarium for patients with acute pancreatitis and respiratory failure as long as there are no contraindications to its use and patients are closely monitored.

Armando Carlos Franco de Godoy
Physical Therapist,
Adult ICU, *Universidade Estadual de Campinas* – Unicamp, State University at Campinas – *Hospital das Clínicas*, Campinas, Brazil

Thiago Rodrigues Araújo Calderan
Physician,
Division of Trauma Surgery, *Universidade Estadual de Campinas* – Unicamp, State University at Campinas – School of Medical Sciences, Campinas, Brazil

Gustavo Pereira Fraga
Coordinator of the Division of Trauma Surgery, Department of Surgery, *Universidade Estadual de Campinas* – Unicamp, State University at Campinas – School of Medical Sciences, Campinas, Brazil

References

1. Jaber S, Chanques G, Sebbane M, Salhi F, Delay JM, Perrigault PF, et al. Noninvasive positive pressure ventilation in patients with respiratory failure due to severe acute pancreatitis. Respiration. 2006;73(2):166-72. PMid:16432295. http://dx.doi.org/10.1159/000088897
2. Pneumatikos I, Bouros D. Noninvasive ventilation in acute pancreatitis respiratory failure: deus ex machina? Respiration. 2006;73(2):147-8. PMid:16549943. http://dx.doi.org/10.1159/000091531
3. Sociedade Brasileira de Pneumologia e Tisiologia. III Consenso Brasileiro de Ventilação Mecânica. J Bras Pneumol. 2007;33(Suppl 2):S1-S150.

Submitted: 8 March 2012. Accepted, after review: 20 March 2012.