

## Chapter 2

### RADIOLOGY FINDINGS AND NON-INVASIVE VENTILATION RESPONSE

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Non-invasive ventilation (NIV) is a well-accepted method in type 2 hypercapnic respiratory failure. NIV refers to the use of ventilator support without an endotracheal tube or tracheostomy tube. Its popularity is increasing in different countries also in Europe. It can be used both in acute and chronic respiratory failure and also in homecare and intensive care settings. It has replaced invasive methods due to its flexibility and ease of use.

NIV plays an important role in the treatment of acute respiratory failure. It alters the disease process in disorders such as acute exacerbation of chronic obstructive pulmonary disease (COPD) and shortens the duration of invasive mechanical ventilation (IMV), moreover, it decreases the need for intubation and invasive ventilation, reducing IMV-related complications and risks. NIV is relatively easy to use and well-tolerated by patients.

It may change the disease process and severity when used in an accurate and timely manner.

NIV can be applied in two different ways: non-invasive positive pressure ventilation (NIV) and continuous positive airway pressure (CPAP). NIPPV is the combination of inspiratory positive airway pressure (IPAP) and positive end-expiratory pressure/expiratory positive airway pressure (PEEP/EPAP) provided via a mask. Biphasic positive airway pressure (BIPAP) or non-invasive pressure-supported ventilation (NIPSV) is also used to define NIV. CPAP provides positive airway pressure during both inspiration and expiration while BIPAP ensures differential pressure at 2 levels: IPAP in inspiration and EPAP in expiration. Profound understanding of technique and accurate patient selection

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results when compared to CPAP and lifestyle changes.

Although NIV has been increasingly used, success isn't growing consistently. This may be caused by the lack of experience and patient-ventilator mismatch; however, the patency of the upper respiratory tract also makes significant contribution [25]. The patency of the upper respiratory tract may be diminished in response to positive pressure, resulting in decreased minute-ventilation. There is a complex interaction between genioglossus muscle activity and soft tissues. Electromyography can provide information regarding movements of the laryngeal muscles (genioglossus or cricothyroid muscles) but no data can be obtained regarding movements of soft tissues. Additional methods are needed to assess the patency of the upper respiratory tract. MR imaging can provide such information; however, it is expensive and cumbersome in patients receiving NIV. In recent years, it has been suggested that sonography can visualize the patency of the upper respiratory tract. Endoscopy was used for this purpose but the ideal method hasn't been established [29].

## **CONCLUSION**

In the future, clinical care and assessment will most probably include some combination of the above-mentioned imaging modalities and standard assessment of disease severity.

## **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

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