

To Assess the Impact of Inspiratory Pressure Levels in Non Invasive Ventilation in COPD

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ABSTRACT

Aim: To compare the use of low intensity non-invasive positive pressure ventilation (LI-NPPV) with High intensity non- invasive positive pressure ventilation (HI-NPPV), during night and compared their effect on night sleep and physiological parameters such as blood gases and lung functions.

Methods: Pressure limited NPPV in assist control mode together with supplemented oxygen was used in all patients.

Results: Twenty patients were studied and it showed patients well tolerate d. HI-NPPV and also improved important physiological parameters such as Arterial blood gases and lung functions.

Conclusion: In patients with COPD high respiratory pressures used with HI-NPPV produce acceptable sleep quality that is no worse than that produced by low inspiratory pressures which are more traditionally applied in conjunction with LI-NPPV. In addition higher pressures are more successful in maintaining sufficient alveolar ventilation compared with low pressures, it is also capable of improving arterial blood gases and lung functions. Thus HI-NPPV is very promising and should be used instead of LI-NPPV.

Key words: Inspiratory pressure, NPPV, hypercapnic respiratory failure

INTRODUCTION

Non-invasive positive pressure ventilation (NPPV) is now widely used to treat Hypercapnic Respiratory failures. High intensity (NPPV) using controlled NPPV with the highest possible respiratory pressures tolerated by the patient has recently been described as a new and promising approach that is well tolerated and is also capable of improving important physiological parameter such as arterial blood gases and lung function. This clearly contrasts with the conventional approach of low intensity NPPV (LI-NPPV) which uses low inspiratory pressure with assisted form of NPPV.

METHODS

Pressure-limited NPPV in assist/control mode together with supplemented oxygen was used in all patients. HI-NPPV was aimed at maximally decreasing PACO₂ by means of step wise increase in respiratory positive airway pressure (IPAP) and respiratory rate beyond the spontaneous breathing frequency. The NPPV was started by using full face mask and switched over to nasal mask if full face mask were not tolerated by patients. If hypercapnia persisted IPAP was increased by 2cm H₂O, if hypoxemia persisted both IPAP and EPAP were increased by 2 cm H₂O.

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Measurements: Lung function parameters were assessed Arterial Blood Gases were taken. All variables were recorded constantly on ECG polygraph, SPO₂ was continuously measured with pulse oximeter. Patients were randomized to receive either HI-NPPV or LI-NPPV. After 24 hours patient were switched to alternate mode of NPPV.

DISCUSSION

Non invasive ventilation is now being very widely used in COPD exacerbations, chronic heart failure, hypoxemia respiratory failure, post extubation failure and other conditions .NIPPV meaning positive pressure ventilation delivered by non-invasive means in contrast to an invasive connection with the patient via Endotracheal tube. Ram cochrone 2004, Keenan Ann in Med 2003 compared the non-invasive and invasive ventilation and showed that NIPPV reduces hospital stay, complications are much lower and as a result of NIPPV the rate of intubation fell by 42%.

Having established beyond doubt advantage of NIPPV and mark improvement in quality of non-invasive ventilators, development of better tolerating of face masks more and more high pressures are being applied.

In our study firstly sleep quality was compared between HI-NPPV and LI-NPPV because if the patient could not sleep better with HI-NPPV than the physiological benefits could not have been successfully monitored. But we found sleep quality was comparable, therefore high inspiratory pressures do not worsen sleep quality compared with low

pressures in used NPPV in patients with COPD. Nocturnal PACO₂ were lower during HI-NPPV compared with LI-NPPV. Consequently PH was also higher during HI-NPPV compared with LI-NPPV.

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