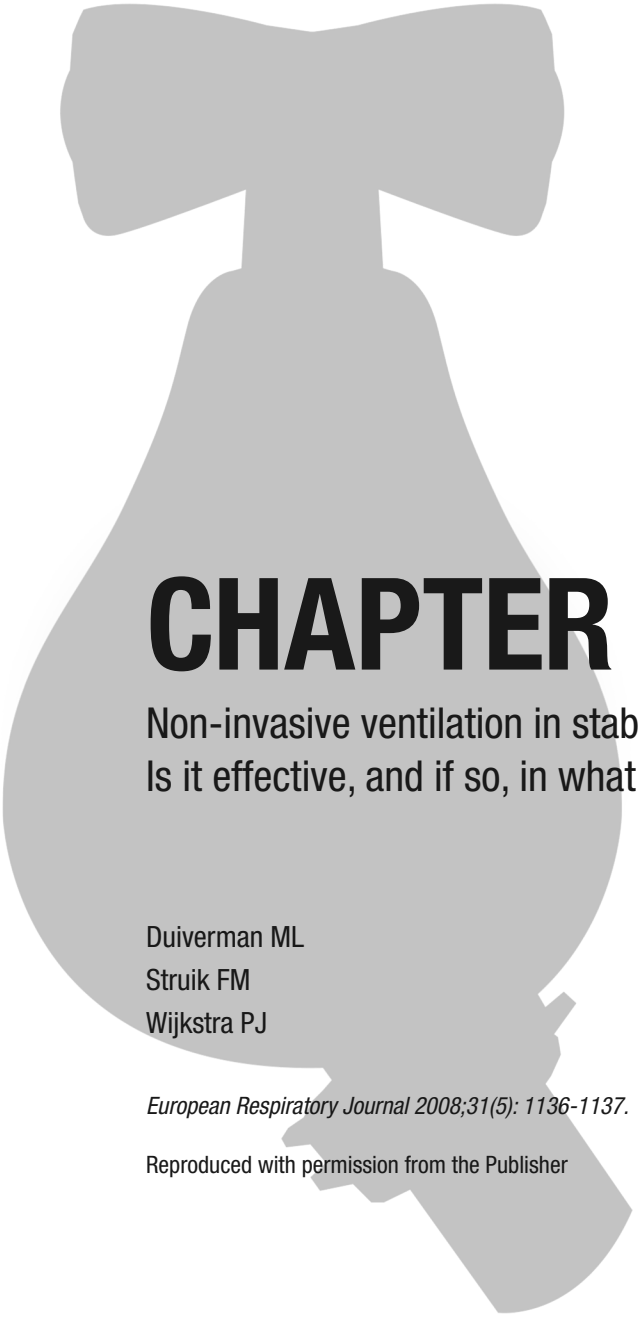

CHAPTER 3

Non-invasive ventilation in stable COPD: Is it effective, and if so, in what way?

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TO THE EDITORS:

We have read with interest the systematic review of Kolodziej about noninvasive positive pressure ventilation (NIPPV) in severe stable chronic obstructive pulmonary disease (COPD).[1] First of all, we would like to complement the authors with their excellent review. It is extremely important that good quality reviews are published in the field of noninvasive positive pressure ventilation in severe stable COPD. The development of new therapeutic options in these patients is increasingly being recognised as urgently needed.

[2]However, we would like to make some comments about the conclusion Kolodziej et al draw in their review. They conclude that bilevel noninvasive positive pressure ventilation used in a select proportion of patients with severe stable COPD can improve gas exchange, exercise tolerance, dyspnoea, work of breathing, frequency of hospitalisation, health-related quality of life and functional status. Following this, they suggest an adjunctive role for the use of bilevel NIPPV in the management of chronic respiratory failure due to COPD.

The first remark we would like to make is that their conclusions were based mostly on non-randomised controlled trails. Combined analysis of the results of the randomised controlled trials (RCTs) did not show effects on arterial blood gases, exercise tolerance, work of breathing, or hospitalisations. Evidence for an improved health-related quality of life was derived from only two studies.[3, 4] Furthermore, in the study of Garrod, the NIPPV group had very low baseline Chronic Respiratory Questionnaire scores, which may have influenced their positive outcome.[4]

Secondly, Kolodziej pooled studies of different study length, different kind of control interventions and different type of ventilation (daytime and nocturnal). They did assess their data on heterogeneity in study quality, patients, interventions, and measurement of outcomes and indeed they showed that heterogeneity was evident in many parameters. This prohibits strong conclusions that NIPPV is as effective in severe stable COPD.

In our opinion, in this review, there is only little discussion about the importance of achieving effective ventilation. It is discussed that with higher hours of ventilatory use, a greater reduction in hypercapnia can be achieved. Although this might be true for nocturnal ventilation, with daytime ventilation large effects might be reached with less hours of NIPPV use. From the RCTs included, a significant reduction in hypercapnia during spontaneous breathing at room air was shown only in the study of Díaz.[5] This study, and also the more recent study of the same group,[6] showed that large effects can be achieved with 3 hours of NIPPV during daytime. During the night, increased upper airway resistance, decreased respiratory drive, and less supervision might lead to the deliverance of less volume to the patient. Therefore, correct monitoring of whether or not effective ventilation is achieved is very important, especially during the night. Kolodziej et al. do address this point of more dynamic monitoring of effectiveness of NIPPV. However, they imply that dynamic monitoring by transcutaneous measurements is preferred above

arterial blood gases alone. However, transcutaneous measurement of CO_2 with current techniques tends to drift overnight.[7] In our opinion, measuring multiple arterial blood gas samples during NIPPV is the golden standard. Unfortunately, until now, no randomised controlled trial has monitored the effectiveness of their intervention in this way.

The second remark relates to the importance of using high inspiratory pressures. Even higher pressures than used in most RCTs might be necessary to achieve normocapnia,[8] although no clear evidence exists on how high pressures exactly should be.

The third remark relates to the selection of appropriate patients. Patients with very severe COPD seem to benefit most. Kolodziej et al emphasise that patients with severe hyperinflation probably benefit most. However, too little evidence currently exists to make a clear statement about whether patients should be selected on basis of the severity of chronic respiratory failure, hyperinflation, or maybe the height of the work of breathing.

To conclude, we do find that the review of Kolodziej is et al. is timely and a major contribution, but we feel the strength of the conclusions is overstated. With this review in hand, some of the gaps in our knowledge are carefully uncovered and should lead to well designed RCTs of sufficient power. Some are undoubtedly underway.

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