

Transcript Details

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The Impact of High-Intensity Noninvasive Ventilation in COPD Management

Announcer:

You're listening to *Clinician's Roundtable* on ReachMD. On this episode, Dr. Alejandra Lastra will discuss when to include high-intensity non-invasive ventilation in COPD management. Dr. Lastra is an Associate Professor of Medicine, Director of the Sleep Medicine Fellowship Program, and Co-Director of the Advanced Respiratory Care Program at the University of Chicago. Here's Dr. Lastra now.

Dr. Lastra:

So the high-intensity noninvasive positive pressure ventilation has been around for about 20 years. The initial trials were conducted in the early 2000s, like 2008, 2009, and they started with small groups of patients. They would be admitted to the hospital. These are patients with chronic hypercarbic respiratory failure and COPD. And they were placed on BiPAP, and they were placed in two groups. One group was called low intensity, and low intensity is what we traditionally think as the usual BiPAP in the ICUs or in the hospital, so low intensity was somewhere like 14/9.

And then they had another group that they called the high-intensity process pressure ventilation group. In the high-intensity positive pressure ventilation group, what they did is they admitted the patients to the hospital, and they increased the IPAP, or the inspiratory positive airway pressure, until the patient was able to tolerate, and that was usually around 30 cm of water, and in some patients, it was as high as 40, 42 cm of water pressure, so we're talking really high pressure compared to what we're used to.

And then they evaluated the two groups over time, and the groups that were in the high-intensity positive pressure ventilation arm had significant decreases in CO₂ levels compared to the ones that were in the low-intensity positive pressure ventilation arm, so there is a physiological difference. And what we know is, in COPD, what improves outcomes is decreasing that CO₂ level effectively.

And so then they conducted another trial, which was a crossover trial, and when they moved the patients from the high-intensity positive pressure ventilation to the low-intensity group, the CO₂ went back up. And so this was a proof of concept model, and we weren't sure if that translated into mortality outcomes. Right? It was more a physiologic response. CO₂ levels come down faster and more effectively in the high-intensity positive pressure ventilation groups, and it was better tolerated.

And so then we had the large clinical trials that were conducted in Europe, and they are two landmark trials, but the major one, HOT-HMV, which is addition of noninvasive ventilation at home for chronic hypercapnic COPD, showed significant improvements in mortality at one year and delay in readmissions and COPD exacerbations. And so we kind of have proven that in chronic hypercarbic COPD, high-intensity positive pressure ventilation in the HOT-HMV trial—the BiPAPs were around 26, 27, 24—significantly decreases CO₂ levels and improves patient-centric outcomes. In the US, we have data from ICD-9 and ICD-10 codes that show that there is decrease in readmissions and mortality.

When we're talking about ventilation, we're really not focusing on medications, bronchodilators, pulmonary rehabilitation, or oxygen. That has obviously been assessed and proven, and the patients should be maximally optimized on medical therapy, and so there is really no good alternative that's noninvasive to positive pressure ventilation because of the high intensity; you're resting the diaphragms, removing CO₂, and you're decreasing work of breathing and ventilating these patients when they use it, especially during sleep.

Announcer:

That was Dr. Alejandra Lastra reviewing when high-intensity non-invasive ventilation is appropriate for COPD management. To access this and other episodes in our series, visit *Clinician's Roundtable* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!

