Miniature ventilator may help COPD patients improve mobility

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A miniature, easy-to-carry ventilation system with a simple nasal mask may help patients with chronic obstructive pulmonary disease (COPD) become more active, according to research conducted at medical centers in California and Utah. The compact design offers an attractive alternative to currently available larger, less comfortableventilators and masks.

The results of the study will be presented at the ATS 2011 International Conference in Denver.

"The results from this study suggest that miniature ventilation systems with non-sealing, low profile nasal masks may offer a new option for improving activity limitation in COPD patients," said Chris Garvey, FNP, MSN, MPA, manager of pulmonary and cardiac rehabilitation at Seton Medical Center in Daly City, CA and lead author of the study. "Stable outpatients with advanced COPD were very comfortable while using the ventilator system and many of the patients studied expressed interest in using the device on a routine basis at home. Although further research is needed, these results suggest that this new system may provide a practical method of improving activity limitation in advanced COPD."

Millions of patients worldwide with advanced COPD experience severe shortness of breath with activities of daily living, and even with treatment, many patients are unable to walk from their door to the mailbox, or up a flight of stairs, without stopping to rest, Ms. Garvey

said.

Although ventilator systems can help patients breathe more easily, most systems are large and heavy and use uncomfortable masks, she noted. The ventilator system tested in this study weighs only about a pound and features a smaller, more comfortable mask.

Researchers enrolled 28 COPD patients on oxygen who had previously completed pulmonary rehabilitation. Patient comfort was tested during a one-hour exposure to ventilator therapy at rest. To determine the efficacy of the system, patients performed two six-minute walking tests, one with nasal cannula oxygen and one while using the ventilator. The order of the experimental and control walks alternated between patients, and total oxygen use in the control and experimental walks were closely matched.

At the conclusion of the study,the researchers found that advanced COPD patients were able to walk farther while using the ventilator and nasal mask interface in comparison to using oxygen alone. In the six-minute walking test, all 28 patients improved the distance walked by 38 meters on average and a subset of patients with especially severe COPD improved their distance by an average of 85meters.

"These results compare favorably with increases in walk distance achieved during the course of a full pulmonary rehabilitation program," Ms. Garvey noted.

The results are similar to results obtained in an earlier trial, which used a less refined version of the mask, she added.

Ms. Garvey said future studies should focus on the physiologic basis for the improved walk distances associated with use of the system, and should determine if home- or pulmonary rehabilitation-based use of the

system leads to enhanced mobility, improvements in quality of life and reduced exacerbations in patients with advanced COPD.

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