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Refillable Oxygen Cylinders May Be an Alternative for Ambulatory Oxygen Therapy in COPD*

Antoine Cuvelier, MD; Jean-François Nuir, MD, FCCP; Nadia Chakroun, MD; Jérôme Aboab, MD; Gabriella Onea, MD and Daniel Benhamou, MD

* From the Service de Pneumologie, Hôpital de Bois-Guillaume, Rouen, France. Correspondence to: Antoine **Cuvelier**, MD, Service de Pneumologie, Hôpital de Bois-Guillaume, CHU de Rouen 76031, Rouen Cedex, France

***Study objectives**:* To compare, in clinical conditions, the efficacy of refilled oxygen cylinders (O_2-HFs) in improving oxygenation and exercise capacity of patients with COPD during a 6-min walking test.

Design: Prospective randomized study with a cross-over design.

***Setting**:* A university teaching hospital.

***Patients**:* Ten patients with COPD, in a stable state and previously treated with long-term domiciliary oxygen therapy. Baseline characteristics were as follows: age, 65 ± 7 years; PaO_2 on room air, 55.4 ± 6.3 mm Hg; $PaCO_2$ on room air, 46.2 ± 7.4 mm Hg; FEV_1/vital capacity, 47 ± 7%; and FEV_1, 30 ± 7% of predicted value (mean ± SD).

Design: All patients performed three successive 6-min walking tests, the first test in room air and the other tests in a randomized order with either a conventional oxygen cylinder (O_2-C) or an O_2-HF.

***Measurements and results**:* The fraction of inspired oxygen (FIO_2) delivered by O_2-HFs was significantly lower than the FIO_2 delivered by O_2-Cs (94.2 ± 2.6% vs 98.8 ± 4.9%, p = 0.02). Mean O_2-HF and O_2-C weights before the walking tests were similar (3,510 ± 251 g and 3,770 ± 142 g, respectively; p = 0.09). Mean transcutaneous oxygen saturation was similarly improved with both oxygen delivery systems. Mean distances with O_2-C (373.5 ± 81 m) and O_2-HF (375 ± 97 m) were not different but significantly improved, as compared with room air (334.5 ± 90 m; p = 0.03 and 0.02, respectively). Dyspnea sensations were similar for the three tests.

***Conclusion**:* O_2-HFs are as efficient as O_2-Cs for performing short-term exercises. Because of a lower cost, pressurizing units may be worthwhile for improving ambulatory oxygen therapy and pulmonary rehabilitation programs.