

[The characteristics of the mechanical activity of the respiratory muscles during the diaphragmatic respiration technic] Pasto M, Gea J, Aguar MC, Barreiro E, Orozco-Levi M, Felez M, Broquetas J. Arch Bronconeumol. 2000 Jan;36(1):13-8.

Noteworthy among breathing training techniques is so-called diaphragmatic breathing. In spite of the technique's name, however, little is known of the functional characteristics of this ventilatory method. **OBJECTIVE:** To assess the mechanics of respiratory muscles, particularly diaphragm muscles, during diaphragmatic breathing in patients with severe chronic obstructive pulmonary disease (COPD). **METHODS:** Ventilatory pattern and respiratory pressures (abdominal [Pga], intrathoracic [Pes] and transdiaphragmatic [Pdi]) were studied in 10 patients with severe COPD in stable phase (age 69 +/- 6 years, FEV1 33 +/- 12% ref) at baseline and during deep breathing with spontaneous muscle recruitment (SMR) and during breathing training. Measurements were taken with the patient seated and in supine decubitus position. **RESULTS:** In seated position ventilatory pattern was similar with SMR and during breathing training. Mean Pdi during airflow, however, was greater during breathing training than with SMR (34.8 +/- 8.0 and 29.3 +/- 9.3 cmH₂O, respectively, $p < 0.05$) for similar levels of Pes. Mechanical effectiveness of the diaphragm expressed as Vt/Pdi) was less during breathing training, however (36.1 +/- 10.4 and 49.5 +/- 15.8 cc/cmH₂O, $p < 0.05$), with no changes in overall efficacy of respiratory muscles (Vt/Pes). In supine decubitus position, ventilatory patterns of SMR and breathing training were similar, although Vt and T1 were slightly higher in the latter (1,065 +/- 305 vs. 1,211 +/- 314 cc, $p < 0.01$; and 2.76 +/- 1.32 vs. 3.07 +/- 1.23 sec, $p < 0.05$). Pdi was also higher during breathing training (29.7 +/- 10.2 and 38.0 +/- 10.5 cmH₂O, $p < 0.05$), although accompanied in this case by a higher Pes (21.2 +/- 7.5 to 26.4 +/- 8.4 cmH₂O, $p < 0.005$). In supine decubitus position, the effectiveness of both diaphragm muscles and respiratory muscles overall was similar for both ventilatory modes. **CONCLUSIONS:** Breathing training truly involves greater use of the diaphragm, both in seated and supine decubitus positions. Breathing training does not provide greater ventilatory efficacy than SMR, however, in COPD patients.