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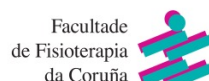


Comparative analysis of respiratory muscle strength between subjects with and without asthma: a pilot study

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INTRODUCTION

Respiratory muscle training is used as treatment for asthmatic patients. Indications show that these muscles have reduced strength. Airflow's obstruction that asthma entails generates pulmonary hyperinflation, placing the diaphragm at mechanical disadvantage. This forces the inspiratory musculature to work in an inadequate position. In addition, systemic corticosteroids prescribed for this condition might cause muscle weakness. However, the available literature that reflects these aspects is scarce.

Obtain current data about respiratory muscles strength in adults with asthma.

aim



METHODS

Design. A cross-sectional pilot study.

Subjects. Patients with asthma and healthy subjects matched by age and sex. Their characteristics are reflected in **Table 1**.

Measurements. The clinical assessment was consisted of:

- ✓ Personal interview.
- ✓ International Physical Activity Questionnaire (IPAQ), short version.
- ✓ Anthropometric data (weight, height, body mass index (BMI)).
- ✓ Forced spirometry (FVC, FEV₁, PEF).
- ✓ **Maximal respiratory pressures.** Maximal inspiratory pressure (P_{Imax}) and maximal expiratory pressure (P_{E_{max}}) were measured following *Spanish Society of Pneumology and Thoracic Surgery (SEPAR)* guideline: 3-5 sec, 6 tests technically correct (without evidences of air leaks and the graphs showing a trend to a plateau), 3 of them differing <5%, using a digital manometer (MicroRPM®). The reference values were calculated using the predictive equations proposed by *Morales et al. (1997)*.

Data analysis. Unpaired T-test was used to compare between groups: P_{Imax}, P_{E_{max}} and all other variables that might affect the values of these respiratory pressures (anthropometric, spirometric and physical activity outcomes).

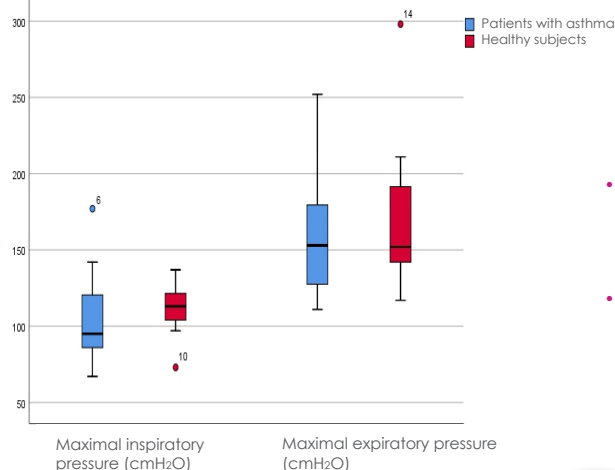


Figure 1. Comparison of maximal respiratory pressures between groups

Table 1. Characteristics of the subjects (n=14)

	AG (n=7)	CG (n=7)
Male/female (n)	3/4	3/4
Age (years)	53.3 (7)	54.3 (6.9)
Weight (Kg)	81.6 (13.4)	65.6 (11.3)
Height (cm)	166 (7)	163.6 (11)
Physical activity level (MET-min/week)	2555.1 (2606.2)	2306.1 (1710.6)
FVC (l)	3.6 (0.9)	4.3 (0.8)
FVC (obs./RV) (%)	89.4 (10.6)	113.4 (12.5)
FEV ₁ (l)	2.6 (0.7)	3.3 (0.6)
FEV ₁ (obs./RV) (%)	87.1 (12.3)	114.1 (10.6)
FEV ₁ /FVC	73.5 (9.2)	78.1 (5.6)
PEF (l/s)	7.2 (2.1)	7.6 (1.5)
P _{Imax} (cmH ₂ O)	107.4 (38.6)	110.6 (20.9)
P _{Imax} obs./RV (%)	99.4 (26.7)	107.9 (19.1)
P _{E_{max}} (cmH ₂ O)	161.4 (48.3)	176.3 (61.4)
P _{E_{max}} obs./RV (%)	100.3 (20.2)	113.9 (22.6)

Values are expressed as mean±standard deviation unless otherwise indicated.

Abbreviations: AG: asthmatic group; CG: control group; cmH₂O: centimetres of water; FVC: forced vital capacity; FEV₁: forced expiratory volume in one second; Kg: kilograms; l: litres; l/s: litres per second; MET: metabolic equivalent task; min: minutes; obs.: observed; PEF: peak expiratory flow; P_{E_{max}}: maximal expiratory pressure; P_{Imax}: maximal inspiratory pressure.

RESULTS



A total of 14 subjects were included: 7 patients with asthma (asthmatic group (AG)) and 7 healthy subjects (control group (CG)).

- **AG:** observed P_{Imax} mean±SD value was **107.4±38.6** cmH₂O, (99.4±26.7% of the reference value); while P_{E_{max}} was **161.4±48.3** cmH₂O (100.3±20.2% of the reference value).
- **CG:** we found a mean±SD P_{Imax} of **110.6±20.9** cmH₂O (107.9±19.1% of the reference value), and a P_{E_{max}} of **176.3±61.4** cmH₂O (113.9±22.6% of the reference value).

CONCLUSION

There are no statistically significant differences in respiratory muscle strength between subjects with and without asthma.

For more information:)



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