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Title: Influence of gender on thoracoabdominal volumes and inspiratory muscular activity during quiet and deep breathings: A cross-sectional study

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Body: Differences between gender on resting pulmonary volumes and inspiratory muscular activity during quiet and deep breathings remains unknown. Objective: To investigate the influence of gender on thoracoabdominal volumes and inspiratory muscular activity analyzed concurrently during quiet and deep breathings. Methods: 136 subjects with normal lung function: 55 males (61±13 yrs, 25.2±4.6 Kg/m²) and 81 females (55±15 yrs, 25.0±5.1 Kg/m²) performed quiet followed by deep breaths. Total Chest wall (V_{CW}), upper (V_{URC}) and lower ribcage (V_{LRC}) and abdominal (V_{ABD}) compartmental volumes were quantified by optoelectronic plethysmography (OEP) concurrently with sternocleidomastoid (SCM), upper (UIC) and lower intercostals (LIC) activity quantified by surface electromyography. One way repeated measures ANOVA with post hoc Student Newman-Keuls were used and significance level was set at 5%. Results: During deep breathing all volumes, except V_{LRC} , were greater in males than in females (V_{CW} =1,845±426 mL vs. 1,313±350 mL, V_{URC} =563±206mL vs. 481±203mL, V_{ABD} =886±306mL vs. 466±197mL, $p<0.001$). In contrary, inspiratory muscular activity was higher in females than in males in LIC (11.0±8.5µV vs. 8.2±5.1µV, $p<0.05$) and SCM (23.9±25.0µV vs. 17.3±12.6µV, $p<0.01$). No differences were observed during quiet breathing. Conclusion: Males breathes greater thoracoabdominal volumes; however, deep breaths require higher inspiratory muscular activity by females.