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Title: Ribcage and abdomen synchrony at different exercise intensities in healthy subjects

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Body: Background: The asynchronous movement between ribcage and abdomen during inspiration and its sensorial repercussions in respiratory patients as COPD has been outstanding (Priori R, J Appl Physiol 2013 InPress). However, the behavior in healthy subjects at different exercise intensities is not fully described. Aims: To evaluate the synchronic or asynchrony displacement of ribcage and abdomen during inspiration at rest and during mild, moderate and intense exercise intensities in healthy subjects undergone maximal incremental cycle. Methods: Eleven healthy subjects were monitored with respiratory inductance plethysmography in the axillar level for the ribcage and in the umbilical level for abdomen, during resting and mild, moderate and strenuous efforts based on the respective tertile. The synchrony between ribcage and abdomen was measured based on the phase shift obtained by the Lissajuos approach [$\theta = \sin\text{-}1(m/s)$]. Results: The phase shift at rest and mild exercise is near to zero (complete synchrony) with a low range (mean 0.63, from -5.0 to 8.0). However, moderate and mainly intense exercise resulted in higher phase shift and higher range (mean 10.6, -35.0 to 51.0), with predominance of ribcage expansion.

Conclusion: In healthy subjects, the synchrony between ribcage and abdomen during inspiration is dependent of exercise intensity. The activation of ribcage is predominant than abdomen recruitment during exercise progression.