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Electromyographic study of the pectoralis major, serratus anterior and external oblique muscles during respiratory activity in humans.

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The present study aimed to assess the simultaneous activities of some considered accessory muscles for respiration and search to what extent, subjects postures and forms of respiratory movements can affect the activities of these muscles in subjects positioned upright and in a supine posture. The electromyographic (EMG) study of the pectoralis major (PM), serratus anterior (SA) and external oblique (EO) muscles was performed in 40 healthy young adult volunteers. Twenty males (mean age 22.55 +/- 6.64 yr.) and twenty females (mean age 21.25 +/- 2.89 yr.) participated. With the use of a pneumotrace respiratory belt device, it was possible to control the respiratory movements by their chest wall displacements when asked to inspire (I) and expire (E) deep through the nose and maximally (forced = F), as well as during normal breathing (normal = N). The muscle signals were processed and the Root Mean Square (RMS) values calculated over a time period of 2.5 s. of activity. The experimental results indicates: 1) Significant differences ($p < 0.05$) in RMS between subjects positioned upright and in supine posture only for EO muscle during F movement, inspiring and expiring; 2) Significant differences ($p < 0.05$) in RMS between N and F movements for PM, SA and EO muscles during inspiration and expiration, either in supine or upright subjects position.

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