

LATISSIMUS DORSI AND ITS ROLE IN BREATHING PROCESS

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INTRODUCTION

The legitimacy of this theme is founded in the fact that latissimus dorsi muscle is continuously showed as an appendicular trunk muscle, which function would be hypothetically restricted to shoulder joint and upper limb cingulum, disregarding its possible action over the thoracic wall and consequently participation in breathing process.

OBJECTIVE

The goal of this study was to verify the recruiting of latissimus dorsi during deep inspiration, confirming its possible participation as an accessory breathing muscle.

METHODS

The subjects of this study were young adults, no smoking subjects, not showing any kind of pathological process in the airways. For electromyographic analysis it was used a MIOTEC model miotool 400 of 4 channels with 14 resolution bits, acquisition per channel of 2000 samples per second, 100x, filter Butterworth high pass 1 polo 0,1Hz and buterworth low pass 2 polo 500 Hz, spacing between electrodes fixed in 30mm. Surface electrodes of Ag/ClAg, round, pre gelded and auto adhesive from MEDITRACE. It was also utilized a volume inspiration stimulator, in order

to facilitate the deep inspiration. Two active eletroctrodes are placed (2 cm apart) approximately 4 cm below the inferior tip of the scapula, half the distance between the spine and the lateral edge of the torso. They are oriented in a slightly oblique angle of approximately 25 degrees (Basmajian & De Luca 1985; Cram & Kasman 1998) The situations the subjects were measured were: (1) subject sitting, breathing freely; (2): subject sitting, breathing with the aid of the stimulator; (3): subject standing, breathing with the stimulator. In the three situations, the volunteer kept the upper limbs along the body, in order to isolate the action of latissimus dorsi over the shoulder joint. This present study disregarded the possible action of this muscle in different postures adopted during breathing with effort and its action in forced expiration, concerning only on its activation during deep inspiration (De Troyer & Estenne, 1998).

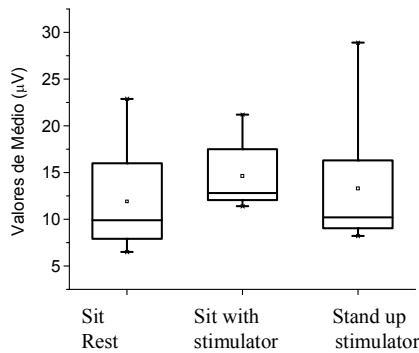
RESULTS AND DISCUSSION

According to results showed below, it was confirmed the action of latissimus dorsi during deep inspiration, specially in sitting position with the aid of a stimulator, what could be evidenced by a huge difference between peak values between the three situations, confirming the recruiting of this muscle in deep inspiration, according to the information in the table and graphic below:

Table 1: Descriptive and comparative analysis of peak value and mean value of latissimus dorsi muscle.

VARIÁVEL	N	MÉDIA	D.P.	MÍN	Q1	MEDIANA	Q3	MÁX	VALOR-P*
SENT_REP_PICO	9	70.82	24.13	46.20	54.30	65.30	84.80	116.00	P=0.001 (X2=13.56; GL=2)
SENT_INC_PICO	9	92.54	52.22	53.10	58.70	65.70	119.20	195.30	
PE_INC_PICO	9	79.60	40.34	43.40	50.60	62.80	105.20	163.30	
SENT_REP_MED	9	11.90	5.39	6.50	8.20	9.90	15.20	22.90	P=0.097 (X2=4.67; GL=2)
SENT_INC_MED	9	14.63	3.51	11.40	12.20	12.80	15.70	21.20	
PE_INC_MED	9	13.30	6.84	8.20	9.60	10.20	12.70	28.90	

*P-value referring to Friedman test for related samples to compare peak and mean values between three situations (values in parenthesis are equivalent to χ^2 statistic and permission length of the test). Significant differences (Wilcoxon test): Peak (Sitting in rest # sitting with the stimulator; sitting with the stimulator# standing with the stimulator)



CONCLUSION

The participation of latissimus dorsi in deep inspiration was confirmed by the results of this study. This way, when an adequate bibliographic revision is done and data collection is made through surface electromyography and through a volume inspiratory stimulator, the study can contribute for the human biomechanic conditions to be enlarged, specially referring to a primordial act, the breathing.

REFERENCES

- BASMAJIAN JV, DE LUCA CJ. *Muscles alive, their functions revealed by eletromyography*. 5ª edição, Baltimore: Williams & Wilkins, 1985, pp. 409-428.
- CRAM JR, KASMAN SG. *Introduction to surface electromyography*. Maryland: Aspen, 1998, p. 334.
- DE TROYER A, ESTENNE M. "Functional anatomy of the respiratory muscles", in: *Clinics in Chest Medicine*, 9 (2), 1988, pp. 175-193.