

COMPARATIVE STUDY OF ELECTROMYOGRAPHIC ACTIVITY OF VENTILATORY MUSCLES DURING MAXIMAL SUSTAINED INSPIRATION EXERCISE, FLOW AND VOLUME RESPIRATORY STIMULATOR

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INTRODUCTION

Evidences suggest that deep inspirations exercises could be so effective as respiratory stimulators (RS) (Oikonen et al, 1991), which are contradictory in clinical practice when referring to the use of flow respiratory stimulator and volume respiratory stimulator (Azeredo 2000). Surface electromyography (EMG) is a non invasive method and very effective to analyze the respiratory muscular activity and its functions (Duiverman et al, 2004). The objective of this study was to investigate the activity of some ventilatory muscles as scalene (ESC), external intercostals (EI) and rectus abdominal (RA) during the utilization of a flow respiratory stimulator, volume respiratory stimulator and maximal sustained inspiration exercise throughout EMG. EMG 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 gelled and auto adhesive from MEDITRACE. (Azeredo 2002; Oikonen 1991)

METHODS

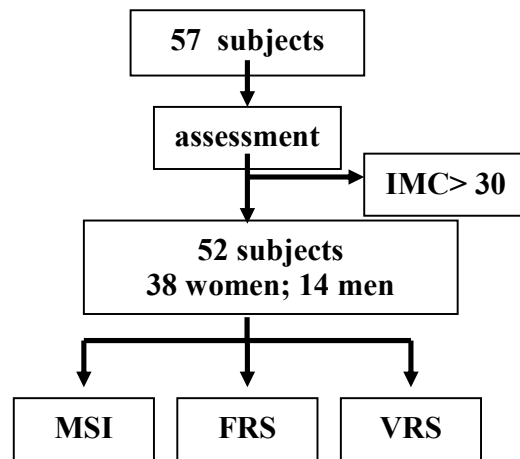


Figure 1: Delineation of the sample. Electromyography data were randomly collected during quiet breathing and pulmonary reexpansion exercises.

RESULTS AND DISCUSSION

It was observed statistically significant differences in the electromyography values for media and peak when comparing maximal sustained inspiration exercises to respiratory stimulators ($p < 0,001$), however there wasn't significance between flow and volume respiratory stimulator for external intercostals ($p = 0,672$) and scalene muscle ($p = 0,943$)

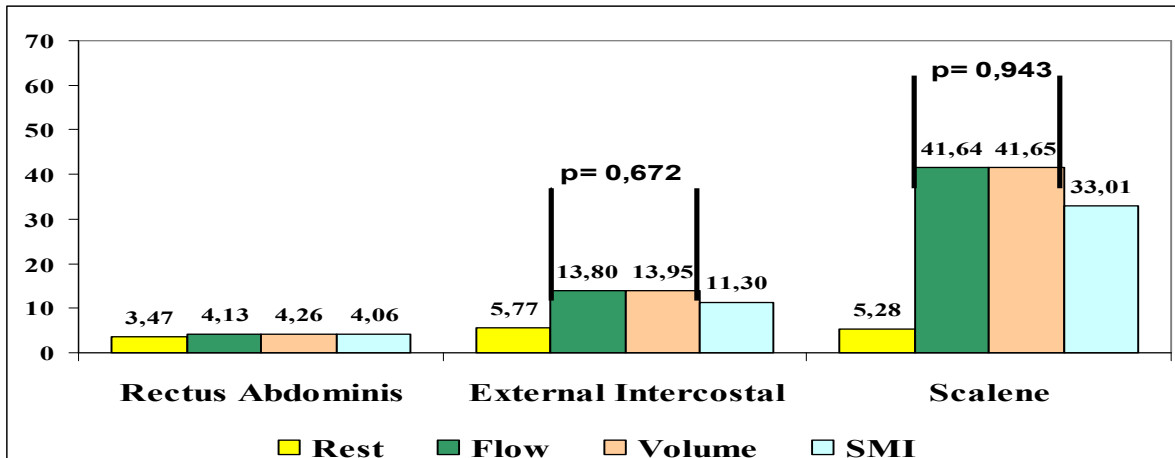


Figure 2: Comparison between analyzed muscles according to electromyographic values of media.

CONCLUSION

Maximal sustained inspiration exercises as well as respiratory stimulators provoked muscle recruiting in the analyzed respiratory musculature, once electromyography activity was higher when the devices were utilized. Rectus abdominals and external intercostals only assist on expiration, so it is not surprising that their activation does not differ much among the tests, whereas scalene are active in inspiration and therefore are more affected by the stimulators.

REFERENCES

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