

EVALUATION OF THE MUSCULAR RELATION OF VASTUS MEDIALIS AND VASTUS LATERALIS DURING THE LANDING OF CABRIOLE IN A BALLET DANCER – CASE STUDY

Fabiana Crovador¹; Ligia Maria Medeiros Niero¹; Francine Barreto Gondo¹
Fabio Navarro Cyrillo¹

UNICID – UNIVERSIDADE CIDADE DE SÃO PAULO - São Paulo, Brazil
E-mail: ftfabiocyrillo@uol.com.br

INTRODUCTION

Among the knee injury mechanisms, the quadriceps performance is an important factor, mainly to perform the technical movements of the classic ballet.

The objective of thi study was to measure the recruitment of the Vastus Medialis (VM) and Vastus Lateralis (VL) muscle fibers during the landing of the *Cabriole* gesture in the classic *ballet*.

METHODS

An electromyographic analysis of the muscle recruitment of the (VM) and (VL) was carried out in a *ballet* dancer, 19 years old, with 15 years of practice, without knee pain was evaluate during the *Cabriole* gesture, which was performed three times with a EMG System of MIOTEC model miotool 400 of 4 channels with 14 resolution bits, acquisition per channel of 2000 samples per second, 100x, RUIÍDO < 2LSB, filter Butterworth hight 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. The VM electrode was placement at 2cm medially from the superior rim of the patella, and for the VL was placed approximately 4 cm above the patella, on an oblique angle just lateral to midline (Cram & Kasman 1998).

An isokinetic Dynamometer (CYBEX NORM) was used to obtain the maximum voluntary contraction of these muscles. (Araujo et al 1995; Basmajian & De Luca 1995).

RESULTS

The first EMG signal detected in the isokinetic dynamometer during the concentric contraction was 124,89 μ V for VM and 198,78 μ V for VL, in the eccentric contraction the data were 162,3 μ V for VM and 234,6 μ V for VL. Whereas during the landing of the gesture the data were 254,87 μ V for VM and 178,45 μ V for VL.

	VM RMS values (μ V)	VL RMS values (μ V)
CYBEX concentric	124,89	198,78
CYBEX eccentric	162,3	234,6
<i>CABRIOLE</i>	254,87	178,45

Table 1. RMS values of the VM and VL activity in concentric and eccentric contraction at CYBEX and during *cabriole* gesture

DISCUSSION

It was possible to observe that during the *Cabriole* landing the VM was more required than the VL, inverting the muscular relation observed inthe isokinetic, what can certainly

cause joint misfit and muscle joint disfunction, accounting for some of the high rates of the knee injury in this sport.

CONCLUSIONS

The research suggests that for the dancer studied sample, during the landing of the *Cabriole* gesture in *ballet*, the VM and VL relation alters, and the VM seems to be more recruited. Other researches with this line, and more subjects could be important to define this biomechanics gesture in ballet dancers.

REFERENCES

- ARAUJO, R.C.; SÁ, M.R.; AMADIO, A.C.,
Estudo sobre as técnicas de colocação de
Eletrodos para eletromiografia de superfície
em músculos do membro inferior. Soc.
Brasileira de Biomecânica, USP, 04, 1995.
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.