

P63: The influence of aging on muscle activation timing during backward stepping

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Introduction: Aging process seems to influence postural control negatively, which has great importance on stepping response after external perturbation.

Objectives: Verify the influence of aging on muscle activation timing in backward stepping, after unexpected external disturbance.

Materials and Methods: Cross sectional study in three groups: Young adults (YG) (n = 9), Adults (AG) (n=9) and Older adults (OAG) (n=10). External disturbance, to provoke backwards stepping, it was performed with 7.5% of body weight load. It was evaluated the activation timings of erector spinae (ES), transversus abdominis/internal oblique (Tra/IO), gluteus medius (GluM), biceps femoris (BF), rectus femoris (RF), medial gastrocnemius (MGas), tibialis anterior (TA) and peroneus longus (PL), on the ipsi (IPSI) and contralateral (CON) side of the stepping, by surface electromyography. It was used a significance level of 0.05.

Results and Discussion: Comparing the 3 groups there were no significant differences on activation time between them, except on CON MGas activation time (AT) that was significantly lower in AG compared with OAG, due to structural and functional deterioration in nerve conduction resulting from aging. Both YG and OAG revealed CON ES AT significantly lower than IPSI ES representing greater muscle postural control on CON side for stepping. OAG IPSI Tra/IO presented AT significantly lower than CON Tra/OI while AG presented CON Tra/IO AT significantly lower than IPSI Tra/OI seeming that this muscle is recruited in AG to ensure greater stability to the steady limb what does not happened in OAG revealing decreased ability to maintain postural control. During backwards stepping as age increases the number of anticipatory postural adjustments decreases, increasing compensatory postural adjustments, due to structural and functional deterioration in nerve conduction resulting from aging.

Conclusion: Muscle activation timing, in backward stepping, after unexpected external disturbance did not seem to be influenced by age.

References

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