

Changes in the reflex excitability of the soleus spinal center in humans performing various motor tasks

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Abstract

The reflex excitability of the soleus spinal motoneurons was assessed in healthy subjects performing different types of motor tasks: voluntary contraction of the flexor (dorsal flexion) and extensor (plantar flexion) muscles of the foot. The effect of the contraction strength of these muscles was also evaluated. During dorsal flexion of the ipsi- and contralateral feet, changes in the reflex excitability of the soleus motoneurons were unidirectional: the excitability decreased. The decrease in the reflex excitability was more profound during dorsal flexion with the maximum strength than with the half-maximum strength. During the plantar flexion of the ipsi- and contralateral feet, the excitability of the soleus motoneurons changed in opposite directions: in some subjects it increased, while in the others it decreased. The reflex excitability of the soleus motoneurons changed to a greater extent during dorsal or plantar flexion of the ipsilateral foot. In the case of plantar flexion, the soleus motor center is possibly affected by a broader spectrum of influences than in the case of dorsal flexion, which can explain the variations in the reflex excitability changes during plantar flexion. © Pleiades Publishing, Inc., 2006.

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