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Letter to the Editor

A few considerations on "Muscle material properties in passive and active stroke-impaired muscle"

Editor,

I read with great interest the article by Lee et al. (2019) and appreciate their clear demonstration of corresponded shear wave velocity (SWV) maps at different percentage of maximum voluntary contraction. I agree with the authors that stroke would potentially alter muscle material properties (Wu et al., 2017). In the current study, Lee at al further showed that SWV increased non-linearly as voluntary activation increased, in both stroke patients and age-matched controls, and that difference of material properties between muscle of the paretic and non-paretic sides, and age-matched controls is not present in active muscles. The authors proposed an important idea that sources of passive and active components related to stiffness may be altered differently post-stroke (Lee et al., 2019). However, the methodology of obtaining SWV in paretic muscles should be clarified before applying this idea into clinical practice.

First, when paresis is severe to some extent, the patient will not be able to control isolated contraction of elbow flexors (synergy pattern), not to mention the percentage of maximum voluntary contraction of the biceps brachii muscle. Even they can do that, tremor usually develops during contraction of the paretic limb, which will interfere with image acquirement of shear wave elastography. In the current study, no severity of paresis (such as Brunnstrom stage) was shown. Second, in this study the subjects were evaluated in a standardized posture because different joint postures will influence muscle stiffness (Wu et al., 2017; Wu and Wang, 2012). However, in this study the humerus was abducted 45°, which will induce axillary pain in most patients with spasticity in shoulder adductors. Pain will further induce spasticity in all affected muscles, thus affecting measured results of muscle stiffness.

The authors' work will impact on clinician's treatment strategy designing, such as deciding which muscles to inject botulinum toxin. Providing more details on the methodology will further help.

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Declaration of Competing Interest

No conflicts of interest to declare.

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Chueh-Hung Wu *
Department of Physical Medicine and Rehabilitation, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan
* Address: Departments of Physical Medicine and Rehabilitation, National Taiwan University Hospital, College of Medicine, National Taiwan University, Taipei, Taiwan, No. 7, Zhongshan S. Rd., Zhongzheng Dist., Taipei City 100, Taiwan.
E-mail address: b88401062@ntu.edu.tw
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