Task-dependent coherence across finger muscles

624.06/VV8

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Motivation

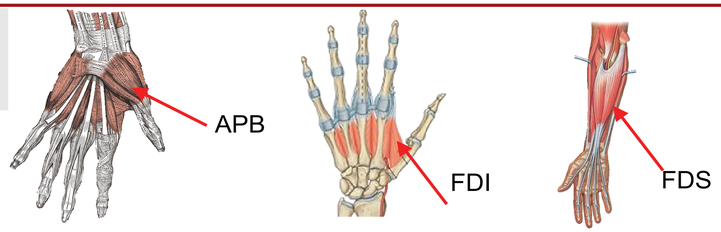
- Coherence analysis can be used to characterize the neural drive shared between muscles[1,2]

- The strength and frequency-content of intermuscular coherence can depend on task, but the principles governing this task-specificity are not clear[3,4]

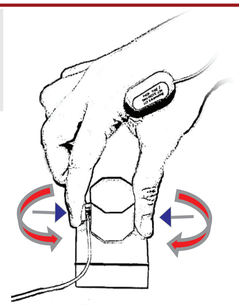
- Here, we investigate how intermuscular coherence changes when functional interactions between muscles are manipulated by task

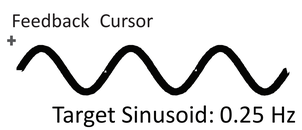
Methods

Surface EMG Recordings



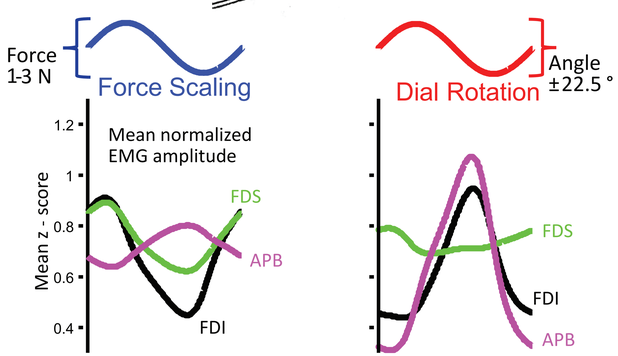
Task





10 healthy adult participants

4 minutes tracking per task



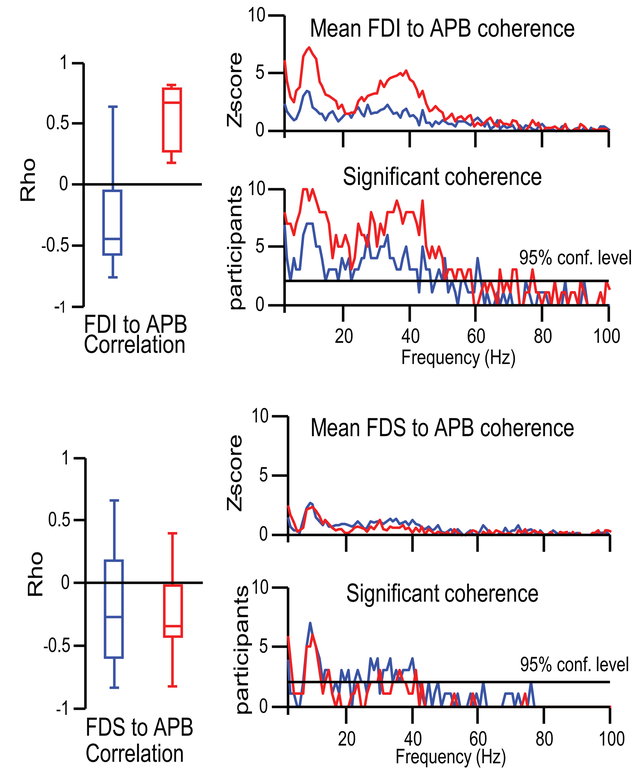
Measures

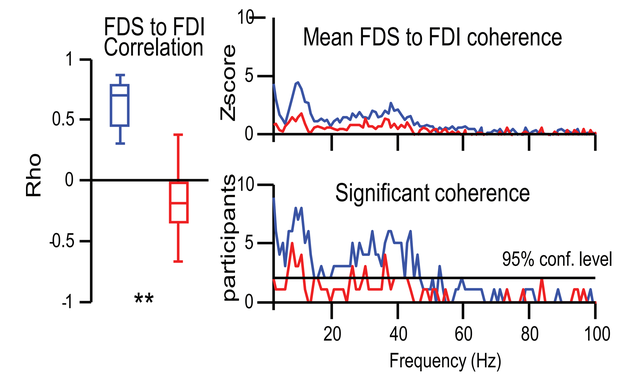
* EMG amplitude envelope correlation

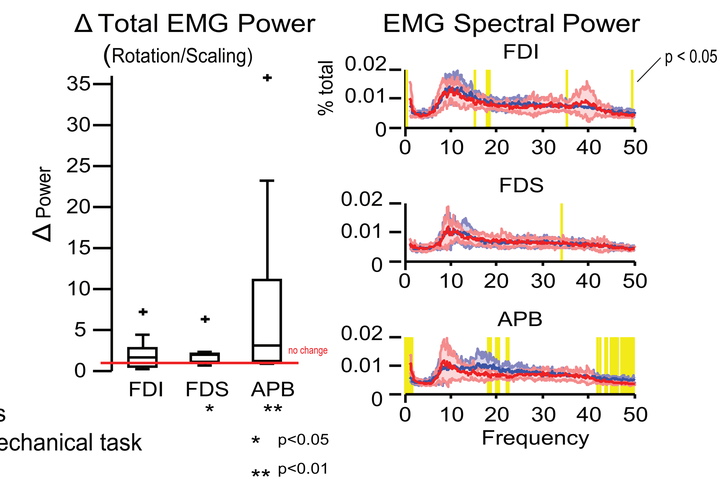
* EMG spectral power

* EMG:EMG coherence

Results







The strength and frequency-content of neural drive shared between muscles may depend upon the relative timing of their activities, as imposed by the mechanical task

Conclusions

* The dynamic relationship between muscles may be an important factor for determining the strength and frequency-content of shared neural drive

* Neural 'binding' of task-related muscles may require specific functional relationships among them

* EMG spectral power cannot explain task-related changes in shared neural drive

References:

[1] Farina et al. (2016)
[2] Boonstra. (2013)
[3] Nazarpour et al. (2012)
[4] Chakarov et al. (2009)

Funding Sources:
NIH Grants AR050520 and AR052345 to FVC