

A study of paraspinal physiology is insufficient to draw clinical conclusions

Jeppesen and colleagues performed a very exacting and precise evaluation of needle electromyography of the paraspinal muscles in 65 healthy subjects.¹ Their data help us understand the physiology, but I have concerns about the clinical implications.

One logical error is the statement that the finding of fibrillation potentials in the paraspinal muscles of asymptomatic persons renders the paraspinal electromyography of questionable usefulness as a diagnostic test. There are established and reproducible ranges of normal for paraspinal fibrillations, and there is substantial evidence that deviation from these norms is an important predictor of disease, including spinal disorders.² Importantly, because fibrillation potentials do occur in asymptomatic subjects, clinicians must use a standardized technique, codified scoring, and a set of norms, or they risk declaring false positives or false negatives. Multiple clinical trials from multiple centers have shown validity and value of paraspinal electromyography using the norms of paraspinal mapping. In fact, this is the only aspect of electromyography supported in the North American Spine Society guidelines for spinal stenosis.^{3,4}

The authors' technique is also unusual and problematic. It involves having subjects minimally contract, then maximally contract each muscle tested while a needle is in it (a procedure that only 56% of their subjects were able to perform), then to lie still for 60 s to permit observation for possible fibrillation potentials. The needle placements themselves are poorly described, despite previous research that validates very precise localization techniques for muscles such as multifidus, longissimus, and iliocostalis, each of which most certainly will have different normative values.⁵ In contrast standard electromyography of the limbs involves only a submaximal contraction to observe motor unit morphology and recruitment, and paraspinal mapping in the back does not even require contraction or motor unit potential analysis.


It remains to be seen whether this process will yield more specificity or more sensitivity for various disorders. For radiculopathy the added value of paraspinal motor unit analysis seems unlikely because fibrillation potentials alone are quite sensitive and specific. There is, however, a dearth of research on paraspinal findings in disorders as common as diabetic neuropathy. These new data do have potential for diagnosis of more generalized neuromuscular disease.

The current work sets the stage for more understanding of the role of paraspinal muscles in nerve and muscle diseases. The

comments about clinical use or interpretation of paraspinal electromyography are of concern.

DATA AVAILABILITY STATEMENT

No data is presented.

Andrew J. Haig MD 

*The University of Michigan, And Haig Physical Medicine PLC,
Middlebury Vermont*

Correspondence

Andrew J. Haig, The University of Michigan, And Haig Physical
Medicine PLC, Middlebury Vermont, 05753, USA.

Email: andyhaig@umich.edu

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ORCID

Andrew J. Haig  <https://orcid.org/0000-0003-0246-6835>

REFERENCES

1. Jeppesen TD, Levison L, Codeluppi L, Karup C. Quantitative electromyography: normative data in paraspinal muscles. *Muscle Nerve*. 2020;62:358-362.
2. Tong HC, Haig AJ, Yamakawa KS, Miner JA. Paraspinal electromyography: age-correlated normative values in asymptomatic subjects. *Spine*. 2005;30(17):E499-E502.
3. Haig AJ. Clinical experience with Paraspinal mapping. II: a simplified technique that eliminates three-fourths of needle insertions. *Arch Phys Med Rehabil*. 1997;78(11):1185-1190.
4. North American Spine Society Clinical Guidelines for Multidisciplinary Spine Care Diagnosis and Treatment of Degenerative Lumbar Spinal Stenosis Copyright © 2011 North American Spine Society. <https://www.spine.org/Portals/0/assets/downloads/ResearchClinicalCare/Guidelines/LumbarStenosis.pdf>. Accessed October 26, 2020.
5. Haig AJ, Moffroid M, Henry S, Pope MH. A technique for needle localization in the paraspinal muscle with cadaveric confirmation. *Muscle Nerve*. 1991;14(6):521-526.