Title Page

A study of paraspinal physiology is insufficient to draw clinical conclusions.

Andrew J. Haig, M.D.

The University of Michigan

And Haig Physical Medicine PLC

andyhaig@umich.edu

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The author has read the Journals position on issues involved in ethical publication.

Jeppesen and colleagues performed a very exacting and precise evaluation of needle electromyography of the paraspinal muscles in 65 healthy subjects. (1) Their data helps 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 seconds 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 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. This new data does 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.

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