Resting electromyographic activity of deep thoracic transversospinalis muscles identified as abnormal with palpation

Gary Fryer, B.Sc.(Osteopathy), Ph.D.1, 2, 3, Michael Bird, Ph.D.4, Barry Robbins, D.O.5, Christian Fossum, D.O. (Norway)1, 2, Jane C. Johnson, M.A.1

1 A.T. Still Research Institute, A.T. Still University, Kirksville, MO, USA
2 Department of Osteopathic Manipulative Medicine, Kirksville College of Osteopathic Medicine, A.T. Still University, Kirksville, MO, USA
3 Center for Aging, Rehabilitation and Exercise Science, Victoria University, Melbourne, Australia
4 Department of Health and Exercise Sciences, Truman State University, Kirksville, MO, USA
5 Department of Neurobehavioral Sciences, Kirksville College of Osteopathic Medicine, A.T. Still University, Kirksville, MO, USA

Context: Early osteopathic researchers suggested that paraspinal tissue abnormality was associated with spontaneous muscle activity, but little research since has re-examined these reports. Objective: To examine whether electromyographic (EMG) activity of sites in the paravertebral gutter (PVG) region that appear abnormal to palpation are different from sites above and below that appear normal. Methods: The thoracic PVG of 25 subjects with thoracic symptoms (current pain [SD] 3.3 [1.9] on 0 to 10 visual analog pain scale) were palpated by two examiners for consensus on the most marked level of tissue abnormality. Dual fine-wire, intramuscular electrodes were inserted into the deep transversospinalis (rotatores, multifidus) muscles at the abnormal level and in two normal sites above and below. Surface electrodes were placed over the erector spine mass adjacent to each intramuscular site. EMG signals were recorded during prone resting to establish a baseline, three maximal voluntary isometric contractions (MVIC), and a second prone resting condition. The area under the curve for a 2-second period was analyzed for each condition and values were normalized using MVIC data. Data were analyzed using a 2-factor repeated measures analysis of variance. Results: There were no significant differences in normalized resting activity between the three intramuscular sites (P=.25) or between the three surface sites (P=.33). Substantial variability in normalized resting activity at each of the three intramuscular sites was evident (mean % MVIC [SD]: abnormal 7.83 [8.76]; normal 9.47 [8.45] and 6.65 [7.39]). There were no significant differences in the intramuscular EMG values between the two resting baseline periods (P = .10). Conclusion: There were no statistical differences between the EMG activity at the abnormal and normal sites, which suggests that factors other than muscle activity are responsible for the apparent abnormality of these tissues to palpation. Investigation of these regions for increased tissue fluid and inflammatory mediators is recommended.

Responsible Author: Michael Bird, mbird@truman.edu; 660-785-4309

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