Lumbar and Cervical Thermography for Nerve Fiber Impingement: A Critical Review

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Abstract: The thermogram can graphically demonstrate the effects of irritation of sensory/autonomic nerve fibers. As such, it is a test of physiology and presents unique information that is not otherwise easily obtained. An analysis of prospective, retrospective, and blinded studies, and, sensitivity, correlative data, specificity, reliability, and predictive value data parameters was performed in regard to lumbar and cervical thermography for nerve fiber impingement. From this analysis, it is concluded that this type of thermography has a diagnostic validity at least equivalent to accepted radiologic procedures such as myelography and CT scanning, and a higher negative predictive value than either. Key Words: Lumbar thermography—Cervical thermography—Nerve fiber impingement, Pain.

EVALUATION OF DIAGNOSTIC PROCEDURES

When a diagnostic medical technology is developed, one needs a method of determining whether or not that technology is valid, providing useful "correct" information. To consider this question with regard to neuromuscular thermography for lumbar or cervical nerve fiber impingement, a general discussion concerning the evaluation of a new diagnostic procedure will be followed by a review of how this type of thermography fits into these measures.

Sensitivity, specificity, accuracy, reliability, comparative studies, and predictive value are the factors used to present the results of evaluating a new modality (1–4).

Sensitivity is defined as the percentage of existing lesions that are detected, and is felt to be the most helpful parameter for evaluating the usefulness of an imaging method, or in comparing it with other methods (100% sensitivity equals no false

negatives). Specificity is defined as the percentage of normal cases identified in an asymptomatic population (100% specificity equals no false positives). A realistic figure for the sensitivity and specificity values of most radiologic procedures is about 80% (1). In their discussion of these terms, Phillips and associates (2) indicate that "sensitivity tells how good the test is among truly diseased subjects, and the specificity tells how good the examination is among disease-free subjects (controls)." Thus, according to these authors, "when a new examination is being investigated, its clinical usefulness can be judged by its sensitivity and specificity." Accuracy (combining sensitivity and specificity), refers to the proportion of correct diagnoses. As discussed in both papers (1,2), however, the concept of accuracy may be misleading. Accuracy refers to either ability to diagnose disease in patients (i.e., sensitivity) or lack of disease in controls (i.e., specificity); the two cannot be incorporated into one concept (2). Gelfand and Ott (1) point out that accuracy is of virtually no value for comparing imaging methods, since the unavoidable inclusion of a differing proportion of normals in each investigation

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