

The diagnostic value of ultrasound compared with nerve conduction velocity in carpal tunnel syndrome patients

Abstract

Introduction: Carpal tunnel syndrome (CTS) is the most common form of peripheral entrapment neuropathy. The use of sonography for investigation and diagnosis of musculoskeletal conditions has been rapidly increasing over the past few decades. The purpose of this study was to determine whether sonography can be an alternative method to nerve conduction study (NCS) in the diagnosis of CTS.

Methods: Individuals with electrodiagnostically proven CTS patients and healthy control subjects were enrolled prospectively. Anthropometric and demographic data included age, height, body mass index (BMI), sex, occupation, medication history, hand dominance, and underlying disorders associated with CTS. Median nerve Cross-Sectional Area (CSA), Flattening Ratio (FR), and flexor retinaculum thickness were measured. Then, comparisons between ultrasonography and nerve conduction study were made.

Results: We assessed 180 wrists, of which 120 were electrophysiologically confirmed as CTS affected wrists and 60 normal wrists in 90 patients (83 women and 7 men). Of the 120 symptomatic wrists, 57 were mild, 29 moderate, and 34 had severe CTS. Sixty three (52.5%) patient had type 2 diabetes, 19 (15.8%) had hypothyroidism, 15 (12.5%) had rheumatoid arthritis, and 5 (4.2%) had chronic renal failure. Post hoc comparisons between the patients with CTS and controls demonstrated that the CSA at various levels of the median nerve were significantly greater in the CTS group than the control group. CSA at the tunnel outlet with a threshold of 12 mm² gave the best diagnostic accuracy with a sensitivity and specificity of 66.7% and 99% respectively. The difference in cross-sectional area of the median nerve in mild, moderate and severe carpal tunnel syndrome was statistically significant.

Conclusion: Ultrasonographic measurement of the cross-sectional area of median nerve is useful in diagnosing and grading CTS. Using sonography as a first-line test may cost-effectively reduce the number of nerve conduction studies in patients with suspected CTS.

Key words: carpal tunnel syndrome, ultrasonography, nerve conduction velocity