

ABSTRACT

An Evaluation Of Risk Factors Commonly Associated With Carpal Tunnel Syndrome
Development. (August 1993)

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This research evaluates the impact of risk factors commonly associated with Carpal Tunnel Syndrome (CTS) on median nerve conduction and vibrotactile sensation measurements. Personal and occupational risk factors associated with the development of Carpal Tunnel Syndrome are considered in the analysis. In addition, data collected on these risk factors was used to develop median nerve conduction and vibrotactile sensation prediction models. Also, this study evaluated the relationship between subjective symptoms associated with CTS and objective testing results. Finally, this study compared techniques presently used to diagnose CTS.

Approximately 127 Video Display Terminal (VDT) operators participated in this study. The Vibratron II was used to measure median nerve vibrotactile sensation for each participant's hands. Also, the NervePace Electroneurometer was used to measure median nerve conduction time for each participant's hands. Survey forms were used to collect data on personal and occupational risk factors. One-way analysis of variance techniques (ANOVA) were used to evaluate data collection results. Multiple Regression techniques were employed to develop prediction models.

Results of this study indicate that significant differences in vibrotactile sensation were noted in participants experiencing CTS symptoms, participants that smoked, and those with previous hand or wrist surgery. Gender, weight, wrist circumference, time spent in repetitive leisure activities, hours worked daily, hand volume measurements, and the personal index rating (developed using medical history,

medications taken, and personal habits) were found to be the best predictors of median nerve vibrotactile sensation. As much as sixty-seven percent of the variation in vibrotactile sensation was accounted for using these variables. Also, significantly higher vibrotactile sensation thresholds were found in participants experiencing difficulty grasping small or large objects. In addition, participants complaining of discomfort in the index and middle fingers had significantly higher threshold values.

Also, results of this study indicate that significant differences in median nerve conduction were noted in participants experiencing CTS symptoms, and participants that smoked. Significant differences in median nerve conduction can be attributed to type of job task performed, wrist circumference, hand circumference, and wrist thickness. Height, weight, hours worked daily, hand volume measurements, and the personal index rating (developed using medical history, medications taken, and personal habits) were found to be the best predictors of median nerve conduction time. As much as fifty-eight percent of the variation in median nerve conduction time was accounted for using these variables. Also, significantly larger nerve conduction time values were found in participants experiencing difficulty grasping small objects and opening jars. In addition, participants complaining of discomfort in the palm of the hand had significantly higher conduction time values.

Comparison of the accuracy of vibrometry, electroneurometry, Phalen's, and the Carpal Compression testing methods in evaluating CTS found Phalen's and the Carpal Compression tests to be the most accurate CTS screening methods. The NervePace electroneurometer was found to be the least accurate device for CTS screening.