Use of screening nerve conduction studies for predicting future carpal tunnel syndrome

Editor—Werner et al consider a question critical to the interpretation of nerve conduction studies used as a screening tool to identify workers at risk of hand and finger disorders associated with repetitive motion. They maintain that an abnormal median sensory nerve conduction in asymptomatic active workers is not predictive of development of hand and finger symptoms in the future. The results do not discuss the possibility of selection bias in choosing asymptomatic workers employed for years in manufacturing jobs with a range of repetitive hand movements. Active workers with abnormal nerve conduction studies who perform repetitive tasks for years and remain asymptomatic may be the ones that have attributes, yet to be determined, that prevent the attainment of a symptom threshold. The lack of follow up nerve conduction studies did not allow the authors to answer their question regarding the predictive value of abnormal median sensory nerve conduction. Without these data it is not known whether the active workers and controls who developed symptoms had a proponent (carpal tunnel syndrome) often found in their nerve conduction studies; whereas the nerve conduction studies in those with no symptoms at follow up remained unchanged or improved. It was only determined that at one point in time 77 active workers had abnormal nerve conduction studies not accompanied by symptoms. As the reliability of abnormal nerve conduction studies in this setting is not established, it may be premature to use nerve conduction studies as a tool to predict future carpal tunnel syndrome. In those with no symptoms at follow up remained unchanged or improved. It was only determined that at one point in time 77 active workers had abnormal nerve conduction studies not accompanied by symptoms. As the reliability of abnormal nerve conduction studies in this setting is not established, it may be premature to use nerve conduction studies as a tool to predict future carpal tunnel syndrome.

Abnormal nerve conduction studies as an isolated finding should not be treated or used to screen out workers but rather should be followed up to establish, if it exists, the natural history of median nerve function and hand symptoms. The sound practice of medicine dictates treatment of the patient, not the abnormal laboratory value. Nerve conduction studies must use norms based on a healthy population without known exposures. If a shift in median nerve function is found more often in workers involved in repetitive activities, this cannot be accepted as a worker norm in the absence of prospective studies to determine the long term consequences. An oft quoted saying by Carl Sagan fits the study's conclusion of carpal tunnel syndrome. It asks, "If nerve conduction studies are not predictive of hand symptoms, "Absence of evidence is not evidence of absence." 

Authors' reply—We appreciate the comments from Bleecker regarding our recent article on the predictive value of nerve conduction studies in predicting future symptoms consistent with carpal tunnel syndrome (CTS). The issues raised are appropriate and will hopefully encourage more research in this area. The concerns about a possible selection bias are real as our study was based upon active workers and did not represent an inception cohort of workers. We agree that this type of study needs to be duplicated with an inception cohort to show the natural history of median nerve conduction across the wrist over time, with a close correlation of hand and finger symptoms. Our sample was randomly chosen and was expected to have a high participation rate. The duration of employment at their present job did not influence the reporting of symptoms in our study; this argues against a selection bias of survivors but does not rule out the possibility.

The issue of whether or not the latency of the median nerve evoked response changes over time in active workers was not considered in our study and may provide some additional information. We believe the natural history of median mononeuropathy at the wrist but it does not assess the risk for CTS. Our study supports the conclusion that an active asymptomatic worker, with a documented median mononeuropathy, is not at increased risk for developing CTS (even though this contradicts our original hypothesis). Knowing the change in latency at follow up would not change this conclusion.

We are in agreement with Bleecker that you treat the patient and not the test. Unfortunately, many clinicians think that a prolonged median latency is the equivalent of carpal tunnel syndrome. This is not true. One of the high sensitivity reported for nerve conduction studies in relation to CTS. We raise the issue that the high sensitivity noted in a clinical setting with symptomatic patients is not found in the cross sectional screening of the workplace. Also, the specificity is lower than previously thought.

This study questions the value of a screening nerve conduction study but also raises issues with their value as a diagnostic test. We think that the current criteria for determining a threshold for a prolongation of the median nerve evoked response across the wrist in the active worker needs to be re-evaluated. Our normative data, from asymptomatic workers, suggest that a relative difference of 0.8 ms be used instead of 0.5 ms that is used in many laboratories. The data from Stefson et al supports the assumption that active industrial workers represent a shift in the population with more prolongation of the median nerve present among active workers. A longitudinal study will be necessary to find whether the active worker with a prolonged median nerve evoked response across the wrist develops any significant problems in the future. Our study showed that within a mean of 17 months of follow up that asymptomatic workers with a median mononeuropathy were not at greater risk of developing symptoms consistent with CTS. This argues against using nerve conduction testing as a screening procedure but a definitive study remains to be done.
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