Predictive value of nerve conduction studies

Editor,—We read with interest the study of Werner et al.1 on the value of nerve conduction studies (NCS) for predicting future carpal tunnel syndrome (CTS) and we think that it deserves comment. Schotland et al.2 and Bingham et al.3 have shown that in a pool of job applicants, screening with NCS was able to identify asymptomatic applicants whose median nerve conduction latencies, although within the normal range, were significantly different from the normal controls and were predictive of developing CTS within 5 years. They reported only 10% of these workers went on to develop symptoms consistent with their clinical diagnosis of CTS.

In our matched control group with normal median nerve conduction for comparison, we found an almost identical incidence of symptoms consistent with CTS. Also, their analysis was done on a per hand instead of per person basis. This analysis is inappropriate as it contradicts the assumption of independent observations; a person's hands are not independent of each other and are exposed to the same generic foundation, body mass index, diet, and other health related factors.

Nathan et al.4 comment that we did not use an electrodiagnostic technique as sensitive as theirs for diagnosing a median mononeuropathy. We maintain that this is precisely what is wrong with some forms of electrodagnostic testing—namely, sensitivity is increased at the expense of specificity. We found a 15% false positive rate for carpal tunnel syndrome with standard electrodagnostic techniques and yet Nathan et al argue that we should have used a more sensitive technique; a suggestion that would only serve to increase the false positive rate. We also analysed the data to look at the more severe cases of median neuropathy to see if these workers were more likely to develop symptoms of CTS. This subset of workers were slightly less likely to develop subsequent symptoms than matched controls.

In regard to their concern that we did not use a standardised definition of CTS in our follow up survey, we maintain that a worker with no complaints of numbness, tingling, pain, or burning in the hand or fingers would not be classified as having CTS even if a Tinel's or Phalen's sign was present. We did not repeat nerve conduction studies or physical examinations on our follow up study but this would not have increased the incidence of CTS.

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6 Nathan PA, Meadows KD, Doyle LS. Relationship of age and sex to sensory conduction of the median nerve at the carpal tunnel and association of slowed conduction with symptoms. Muscle Nerve 1988;11:1149–53.


Author's reply—We appreciate the comments made by Nathan et al regarding our recent article on the use of nerve conduction to predict future symptoms of carpal tunnel syndrome (CTS).3 They have pointed out similar work with some distinct differences. Their study population had a very low average participation rate (26% compared with 81% in our study) and is subject to potential selection bias. The main focus of their longitudinal studies was to evaluate the predictive value of abnormal median nerve conduction in determining future signs and symptoms of CTS regardless of initial symptoms.4 Considering their entire population of workers, an abnormal median nerve conduction study was predictive of symptoms consistent with CTS five years later. Many of the workers with an abnormal median nerve conduction were diagnosed as having CTS in the first evaluation (41%) and not surprisingly still had symptoms five years later. This is very different from our study of asymptomatic workers with an abnormal median nerve conduction compared with matched asymptomatic workers with normal median nerve conduction. They briefly considered the issue of workers with abnormal median nerve conduction who initially were not thought to meet the clinical definition of CTS but were later to be classified as having clinical CTS five years later. These workers were not necessarily asymptomatic; they could have hand or finger symptoms but did not initially meet their clinical definition for CTS.

We repeated that 10% & 14% of these workers went on to develop signs or symptoms consistent with their clinical diagnosis of CTS. This is almost identical with the incidence we found in our study. Unfortunately, they did not report or evaluate an age- and sex-matched control group of workers with normal median nerve conduction for comparison. In our matched control group with normal median nerve conduction, we found an almost identical incidence of symptoms consistent with CTS.

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