Traitement du syndrome du tunnel carpien

Qui fait quoi, quand ... et pourquoi?

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RÉSUMÉ

OBJECTIF Déterminer à quelle fréquence des traitements ont été offerts aux patients pour lesquels une étude de conduction nerveuse (ÉCN) avait été demandée pour confirmer un syndrome du tunnel carpien (STC) éventuel et identifier des facteurs prédictifs potentiels pour ces traitements. Un suivi subséquent devait permettre de vérifier l'influence des résultats de l'ÉCN sur le traitement subséquent.

TYPE D'ÉTUDE Questionnaire d'enquête auto-administré et enquête téléphonique de suivi.

CONTEXTE Hôpital universitaire Royal de l'Université du Saskatchewan à Saskatoon.

PARTICIPANTS Deux cent onze patients auxquels une ÉCN a été prescrite pour confirmer un STC.

PRINCIPAUX PARAMÈTRES MESURÉS Résultats des ÉCN, nombre de patients auxquels des attelles ou des anti-inflammatoires non stéroïdiens ont été prescrits avant et après l'ÉCN, caractéristiques des patients auxquels des traitements ont été prescrits et indication de l'efficacité des traitements.

RÉSULTATS Les études de conduction nerveuse ont confirmé la présence du STC chez 121 (57,3%) des 211 participants. Avant l'ÉCN, on avait prescrit des attelles à 33,2% des patients et des AINS à 38,8% d'entre eux. Un soulagement a été rapporté par 78,3% des patients traités par attelles et par 74% de ceux traités par AINS. On n'a noté aucune différence significative pour ce qui est de l'âge, du sexe, de l'indice de masse corporelle, de la durée des symptômes, des scores pour les symptômes ou la fonction ou des résultats des ÉCN subséquents entre les patients à qui on a prescrit ou non ces traitements ni entre ceux qui ont ou n'ont pas rapporté de soulagement des symptômes. Les résultats du questionnaire de suivi ont montré que le nombre de recommandations pour des attelles et des AINS avait doublé après les ÉCN et que, dans la plupart des cas, on avait au moins discuté de l'intervention chirurgicale. Il n'y avait toutefois pas de rapport entre les recommandations de traitement, incluant la chirurgie, et des facteurs identifiables chez les patients, incluant les résultats des ÉCN.

CONCLUSION Un certain nombre de patients avaient eu un traitement conservateur avant l'ÉCN. Après l'ÉCN, le nombre de prescriptions pour attelles ou AINS avait à peu près doublé. Fait intéressant, les résultats de l'ÉCN ne semblaient pas avoir influencé la décision thérapeutique subséquente entre un traitement conservateur ou chirurgical. D'après nous, ces observations indiquent un manque de confiance dans les résultats de l'étude électrodiagnostique. Il serait intéressant de faire une évaluation prospective d'un plus grand nombre de patients des soins primaires pour mieux comprendre l'utilisation de l'ÉCN dans la prise de décision clinique.

POINTS DE REPÈRE DU RÉDACTEUR

- Même si le syndrome du tunnel carpien (STC) est la plus fréquente des neuropathies compressives du membre supérieur, il n'existe pas de test standard reconnu pour son diagnostic.
- Cette étude rapporte à quelle fréquence des traitements ont été offerts aux patients pour lesquels une étude de conduction nerveuse (ÉCN) avaient été demandée pour confirmer un STC, identifie les facteurs prédictifs en vue d'interventions spécifiques et détermine les effets des résultats de l'ÉCN sur le choix éventuel des traitements.
- Avant l'ÉCN, on avait prescrit des traitements conservateurs à quelques-uns des participants. Après l'ÉCN, le nombre de prescriptions pour des attelles ou des anti-inflammatoires non stéroïdiens avait à peu près doublé.

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Treatments for carpal tunnel syndrome

Who does what, when... and why?

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ABSTRACT

OBJECTIVE To determine how frequently treatments had been offered to patients with suspected diagnoses of carpal tunnel syndrome (CTS) who had been referred for confirmatory nerve conduction studies (NCSs) and to identify potential predictors of such treatment. A follow-up survey was conducted to determine the effect of NCS results on subsequent treatment.

DESIGN Self-administered survey questionnaire and follow-up telephone survey.

SETTING Royal University Hospital at the University of Saskatchewan in Saskatoon.

PARTICIPANTS Two hundred eleven patients with clinically suspected CTS who had been referred for confirmatory NCS.

MAIN OUTCOME MEASURES Results of NCSs, number of patients prescribed wrist splints or nonsteroidal anti-inflammatory drugs (NSAIDs) before and after NCSs, patient characteristics associated with being prescribed therapy, and reporting benefit of therapy.

RESULTS Nerve conduction studies confirmed CTS in 121 (57.3%) of the 211 study patients. Before NCSs, wrist splints and NSAIDs had been prescribed to 33.2% and 38.8% of patients, respectively. Splints and NSAIDs were reported to alleviate symptoms by 78.3% and 74% of patients, respectively, who received such treatments. No significant differences in age, sex, body mass index, symptom duration, symptom or function scores, or subsequent NCS results were noted between patients who were and were not prescribed these therapies or between those who did or did not report improvement in symptoms. Results of the follow-up survey indicated that the number of recommendations for splints and NSAIDs had doubled after NCSs were completed and that surgical intervention had been at least discussed in most cases. Treatment recommendations, including surgery, however, were not associated with identifiable patient factors, including patients' NCS results.

CONCLUSION Some patients were prescribed conservative treatments before NCSs. Following NCSs, prescriptions for wrist splints or NSAIDs approximately doubled. Interestingly, NCS results did not appear to influence subsequent therapeutic decision-making for either conservative treatment or surgical options. We think these findings suggest a lack of confidence in electrodiagnostic study results. It would be interesting to evaluate a larger population of primary care patients prospectively to examine further the use of NCSs in current clinical decision-making.

EDITOR'S KEY POINTS

- Although carpal tunnel syndrome (CTS) is the most common compressive neuropathy in the arms, there is no criterion standard test for it.
- This study describes how frequently treatments had been offered to patients with suspected diagnoses of CTS who had been referred for confirmatory nerve conduction studies (NCSs), identifies potential predictors for specific interventions, and determines the effect of NCS results on subsequent treatment choices.
- A few study patients were prescribed conservative treatments before NCS. Following NCS, prescriptions for splints or nonsteroidal anti-inflammatory drugs approximately doubled.

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Carpal tunnel syndrome (CTS) is the most common compressive neuropathy in the arms and is associated with substantial socioeconomic cost.[1-3] Diagnosis of CTS is based on history, physical examination, and electrodiagnostic testing. Although a common diagnosis, there seems to be no criterion standard test for CTS. Physical examination maneuvers for CTS have been repeatedly shown to be of limited use in diagnosis.[4-6] Results of nerve conduction studies (NCSs) are often held to be definitive, but several investigators have questioned this assumption. In 1997, Concannon et al found a 13% rate of false-negative results from NCSs among their surgical CTS patients.[7] Homan et al published a cross-sectional study of 824 workers that showed poor overlap between reported symptoms and results of physical examination and NCS.[8] In a CTS prevalence survey in Sweden, Atroshi et al reported an 18% false-positive rate for NCS results and found that less than half of those reporting CTS-like symptoms had confirmatory NCS results.[9] These studies suggest the positive and negative predictive value of NCSs for diagnosis of CTS is less than optimal. Although the symptoms and signs of CTS are widely recognized, objective diagnostic confirmation can be elusive, so questions then arise as to which therapeutic intervention is appropriate and when.

We surveyed a group of patients with suspected diagnoses of CTS referred for confirmatory NCSs. We wished to determine how frequently treatments had been offered and to identify potential predictors, such as symptom scores, of such treatments. We conducted a follow-up survey to determine the effect of NCS results on subsequent treatment. To our knowledge, this information has not been reported previously for patients with CTS.

METHODS

This was a single-site prospective study of patients referred for NCS from January to November 2003 at Royal University Hospital in Saskatoon, Sask. Our NCS requisition requests referring physicians to indicate specifically whether CTS is the clinical diagnosis. Patients whose requisitions indicated consideration of CTS only were invited to participate in this self-administered survey. Informed consent was obtained from all participants. Participants completed the questionnaire just before their scheduled NCSs. The survey included the questionnaire by Levine et al,[10] questions on demographics, and questions on past and present therapeutic interventions recommended or used for symptoms of CTS. All NCS results were interpreted by a neurologist. The interpreting neurologist and the electophysiology technologist conducting the NCS were blinded to survey responses.

The Levine et al questionnaire is a self-administered tool for measuring symptoms and function in CTS patients. It is a validated tool with excellent reproducibility, responsiveness, and internal consistency.[10] Minimum and maximum cumulative symptom scores are 11 and 55, respectively; minimum and maximum cumulative function scores are 8 and 40, respectively. Higher scores are associated with greater severity of disease.

Therapeutic interventions included prescription, recommendation, purchase, use, adjustment, and perceived benefit of wrist splints; prescription, recommendation, purchase, use, and perceived benefit of NSAIDs; injection and perceived benefit of intra–carpal-tunnel corticosteroids; use of vitamin B6 or multivitamins; discussion of surgical referral; and surgical consultation. Questions to assess the perceived benefit of these interventions required responses on a 4-point scale: yes—a great deal, yes—somewhat, uncertain, or not at all. A follow-up survey regarding use of these interventions after patients had undergone NCSs was completed through telephone interviews during July and August 2004.

Our clinical neuro-electrodiagnostic laboratory uses the Nicolet Viking IVP for NCSs. Positive results of NCSs for CTS are defined as demonstrating 1 or more of the following characteristics:[11-13]

- median motor nerve latency >4.2 milliseconds,
- median sensory nerve latency >3.7 milliseconds,
- orthodromic median palmar sensory nerve latency (8 cm) >2.2 milliseconds, or
- antedromic wrist to palm (7 cm) median sensory nerve distal latency (from wrist to digit 3 to palm to digit 3) >2 milliseconds.

Data were analyzed using the Statistical Package for the Social Sciences, version 12.0. Independent 2-tailed *t* tests were used for 2-group comparisons of continuous data. χ^2 tests were used to evaluate data on frequency. The Bonferroni method was used to correct for multiple comparisons. Sample-size calculation was based on detecting a 10% difference in symptom scores between treatment groups. The minimum sample size required was 200 patients for a 2-sided significance level of 5% and a power of 80%.[10,14] Approval for this study was obtained from University of Saskatchewan's Behavioural Research Ethics Board.

RESULTS

We identified 240 patients undergoing NCSs for CTS during the recruitment period and invited each of them to participate in the study. A total of 211 patients (156 women and 55 men) gave consent for access to their medical records and completed the survey. Family

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physicians referred 183 patients (88.6%), and specialists (rheumatologists, neurologists, or hand surgeons) referred the remainder. Mean age was 46.4 years (range 21 to 88 years) for women and 44.9 years (range 23 to 83 years) for men. Mean duration of CTS-like symptoms before NCS was 29.3 months (range 1 to 300). Median duration was 14 months.

Results of NCSs are shown in **Table 1**. For purposes of comparison, the 121 patients with electrophysiologic support for a diagnosis of CTS in 1 or both wrists were regarded as the positive group, and the 90 patients with normal results or with non-CTS abnormalities were regarded as the negative group.

Therapy was recommended to some patients before NCSs. Patients' use of wrist splints is shown in **Table 2**. "Some" or "a great deal of" improvement in symptoms was attributed to splint use by 54 (78.3%) patients, despite the fact that 25 of these 54 had negative results of NCSs. No differences were observed between positive and negative NCS groups in frequency of splint prescriptions or reported improvement.

Nonsteroidal anti-inflammatory drugs were prescribed for 52 of the 211 (24.6%) patients, and another 30 (14.2%) obtained NSAIDs without prescriptions. "Some" or "a great deal of" improvement in symptoms attributed to NSAID use was reported by 61 of the 82 (74.4%) even though 28 of these 61 had negative NCS findings. Reported duration of NSAID use ranged from 1 to 204 months, with a mean duration of 17.6 months and a median of 6 months. The improvement attributed to NSAIDs did not correlate with the duration of NSAID use reported, and no differences were observed between positive and negative NCS groups in number of NSAID prescriptions or recommendations or in reported improvement.

Table 1. Results of nerve conduction studies for CTS: *N = 211.*

RESULTS	N (%)
Normal	83 (39.9)
Confirmatory for CTS in 1 or both wrists	121 (57.3)
Positive for non-CTS abnormalities	7 (3.3)

CTS—carpal tunnel syndrome.

Table 2. Patients' use of recommended wrist splints: *70 of 211 (33.2%) patients were prescribed wrist splints; 69 patients obtained them (N = 69).*

USE OF WRIST SPLINTS	N (%)
Had wrist splints adjusted	9 (13.0)
Always wore the splints at night	21 (30.4)
Occasionally wore the splints at night	37 (53.6)
Never wore the splints at night	11 (15.9)
Wore the splints 1 hour or less during the day	30 (43.5)
Wore the splints between 2 and 6 hours during the day	18 (26.1)
Wore the splints more than 6 hours during the day	21 (30.4)
Reported some or a great deal of improvement in symptoms with use of wrist splints	54 (78.3)

Thirty-five patients reported using both splints and NSAIDs. Thirty of the 35 (85.7%) reported "some" or "a great deal of" improvement attributed to either splints or NSAIDs. There were no significant differences between positive and negative NCS groups in reported improvement or use of either NSAIDs or splints. No statistically significant differences in age, body mass index (BMI), sex, symptom duration, or Levine symptom or function scores were noted between groups that were or were not prescribed or recommended either splints or NSAIDs or between those who did and did not attribute improvement in symptoms to either.

Vitamin B6 use was reported by 18 (8.5%) and multivitamin use by 80 (37.9%) patients. No significant differences in vitamin use were seen between groups. Intra–carpal-tunnel corticosteroid injections were received by 4 (1.9%) patients. Discussions regarding surgical referral were recalled by 67 (31.8%) patients. A further 20 (9.5%) patients had seen a surgeon for their current symptoms. No patients had undergone surgical decompression.

In July and August 2004, 102 patients (66 women and 36 men) completed a follow-up questionnaire through telephone interviews. Mean age of these patients was 46.2 years (range 23 to 83 years) and their mean duration of CTS symptoms was 30.8 months. Among these 102 patients, NCS findings were negative for 45 and positive for 57. Use of conservative treatments before NCSs in this group was similar to use in the larger population. After NCSs, splints were recommended to 60 of the 102 (58.8%) patients, and NSAIDs were prescribed or recommended to 60 patients. These treatment recommendations did not correlate with NCS findings. No differences were observed in frequency of wrist-splint or NSAID use between positive and negative groups. Of the 57 patients with positive results of NCSs, 33 (57.8%) were prescribed splints. Similar findings were observed for local corticosteroid injections and surgery. Of the 102 patients, 7 had received corticosteroid injections after NCSs. Four of these 7 had positive results of NCSs, and 3 had negative results. Surgical referral had been discussed with 68 of the 102 patients after NCS; half of them had had positive results and half had had negative results of NCSs. After NCSs, 26 of the 102 patients (25.5%) had had surgical decompression; 14 had had negative results and 12 had had positive results of NCSs.

DISCUSSION

Recommendations for treatment for CTS were not associated with any patient factors that we could identify. We found no correlation between use of NSAIDs or wrist splints and patients' age, sex, BMI, symptom duration, symptom or function scores, or even NCS results.

Interventions were well received. Benefit of therapy was reported by 78% of splint users and 74% of NSAID users, and was not associated with age, sex, BMI, symptom duration, symptom score, function scores, or subsequent NCS results. This, of course, does not confirm that either wrist splints or NSAIDs was efficacious in management of CTS. It does, however, show that most patients perceived that these measures were of value, at least in management of CTS-like symptoms, regardless of NCS results. The argument could be made that noninvasive conservative treatments that seem to help could be recommended to patients with CTS-type symptoms before, or regardless of, electrodiagnostic studies.

Although reported use of NSAIDs and wrist splints approximately doubled after NCS, there was no significant difference in use of them based on NCS results. Surgical decompression was used for patients with both negative and positive results of NCSs. These findings suggest that NCS results did not greatly influence therapeutic decision-making.

Limitations

With any survey, recall bias and misplaced attribution are of concern. Our patients were surveyed initially minutes before NCS. As NSAIDs and vitamins are used widely for many reasons, reported use or perceived benefit of either of these agents might be underestimated. We would not expect that to be true for wrist splints, corticosteroid injections, or surgical intervention, however. Approximately half the group completed a second survey several months after NCS. The increased use of NSAIDs reported in this second survey paralleled the increased use of wrist splints, making recall bias unlikely.

Our study population was limited to patients referred for NCSs, and as such, might not be representative of the wider patient population. It is likely that greater diagnostic uncertainty existed for these patients than for others. We think our findings suggest a lack of confidence in electrodiagnostic study results because subsequent treatment recommendations appeared somewhat arbitrary. It would be interesting to evaluate a larger population of patients from primary care settings prospectively to examine further whether results of NCSs affect current clinical decision-making. With the advances in ultrasound examination of the carpal tunnel,[15] it might be possible to compare structural assessments with electrophysiologic data for greater accuracy of diagnosis.[16] We think future studies to clarify diagnosis of functionally significant CTS will be valuable.

Conclusion

Some patients were prescribed conservative treatments for CTS before NCS. Following NCS, prescriptions for wrist splints or NSAIDs approximately doubled. Interestingly, NCS results did not appear to influence subsequent therapeutic decisions regarding either conservative or surgical treatments.

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Contributors

Dr Taylor-Gjevre *conceived and designed the study, collected and analyzed the data, and wrote the manuscript.* **Dr Gjevre** *assisted in study design and data analysis.* **Ms Strueby** *and* **Dr Boyle** *assisted in data collection.* **Dr Nair** *assisted in data interpretation.* **Dr Sibley** *assisted in study design and data interpretation. All the authors assisted in revising the manuscript and gave final approval to the version submitted.*

Competing interests

None declared

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