SCIENTIFIC ARTICLE

Pain and Carpal Tunnel Syndrome

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Purpose Pain is not a classical symptom of carpal tunnel syndrome (CTS), with the exception of numbness that is so intense that it is described by patients as painful. The primary aim of our study was to determine which factors correlated with pain for patients diagnosed with CTS.

Methods We prospectively assessed all patients diagnosed with CTS in our unit over a 1-year period. We recorded demographic details for all patients, including past medical history, body mass index, smoking, and occupation. The diagnosis and severity of carpal tunnel syndrome were established through a combination of history, clinical assessment, and nerve conduction studies. Of 275 patients diagnosed and treated for CTS, 183 were women (67%), the mean age was 55 years (range, 22–87 y), and 166 cases were bilateral (60%). The mean body mass index was 29.5 kg/m^2 (range, 17–48 kg/m^2), and 81 patients smoked (30%). Patients completed a Short Form–McGill pain questionnaire (SF-MPQ) as a measure of pain at initial presentation. We assessed outcome 1 year after intervention using the *Quick* Disabilities of the Arm, Shoulder, and Hand (*Quick*DASH) score.

Results We found no association between pain according to the SF-MPQ and the positive clinical signs of CTS or positive nerve conduction studies. Multivariate analysis demonstrated that smoking and bilateral disease independently correlated with the overall SF-MPQ, with similar findings on subanalysis. Independent factors associated with an increased improvement in the *Quick*DASH at 1 year were the presentation *Quick*DASH score, positive nerve conduction studies, and smoking.

Conclusions The only independent factors that correlated with pain at presentation of CTS were smoking and bilateral disease. Pain according to the SF-MPQ was not associated with classical clinical findings of the disease or with positive findings on nerve conduction testing.

Type of study/level of evidence Prognostic I.

Key words Carpal tunnel syndrome, pain, diagnosis, nerve conduction studies, outcome.

CARPAL TUNNEL SYNDROME (CTS) is the most common peripheral mononeuropathy. It affects the median nerve as it crosses the wrist posterior to the transverse carpal ligament.[1–3] Carpal tunnel syndrome classically presents with progressive paraesthesia in the radial 3.5 digits and with weakness of thumb abduction, and in the later stages, atrophy of the intrinsic thenar muscles.[4–6] Despite the lack of a consensus reference standard for the diagnosis of CTS, there are no firm data stating that pain is characteristic of con-

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TABLE 1. Details of Clinical and Neurophysiological Assessment in 275 Patients

Demographics and Clinical History	Males (n = 92)	Females (n = 183)
Age, mean (range, SD)	57 (25–87, 14)	54 (22–86, 14)
Body mass index, kg/m^2	29 (19–45, 5)	30 (17–48, 6.4)
Deprivation quintile, n (%)		
1 (most deprived)	17 (19)	39 (21)
2	23 (25)	47 (26)
3	19 (21)	28 (15)
4	16 (17)	23 (13)
5 (least deprived)	11 (12)	31 (17)
Unknown	6 (6)	15 (8)
Smoker, n (%)	25 (27)	56 (31)
Vibrational tool use, n (%)	50 (54)	40 (22)
Diagnostic testing, n (%)		
Negative	6 (7)	16 (9)
Positive	86 (94)	162 (89)
Not performed	0	5 (3)
SF-MPQ, mean (range, SD)		
Sensory	10 (0–33, 8.8)	13 (0–33, 8.4)
Affective	1.8 (0–12, 2.8)	2.5 (0–12, 3)
Overall score	22 (5–55, 12)	26 (4–58, 11)
*Quick*DASH, mean (range, SD)	46 (2–95, 25)	57 (19, 5–100)

firmed CTS, and it is not predictive of positive neurophysiological testing for the disease.[7,8]

Pain associated with activity, particularly repeated activity such as computer work, can be misdiagnosed as CTS.[9] Pain quality and intensity in patients with suspected CTS have been found to be associated with illness behavior, in particular depression and misinterpretation of nociception.[8,10–12] Factors associated with positive neurophysiological testing for CTS include increasing age, positive clinical findings, and high physician confidence in the pretest diagnosis.[7,13,14] The correlation between pain intensity and the clinical signs of CTS has not been clearly defined, nor has the correlation between pain and outcome.

The primary aim of our study was to determine which factors are correlated with pain, according to the Short Form–McGill pain questionnaire (SF-MPQ), for patients diagnosed with CTS. In particular, we wanted to determine whether there was an association between the classical findings of CTS and pain according to the SF-MPQ. Our secondary aim was to establish whether pain at presentation influenced the patient-reported outcome according to the *Quick* Disabilities of the Arm, Shoulder, and Hand (DASH) score 1 year after intervention.

METHODS

This prospective study included all adult patients presenting over a 1-year period to a single surgeon hand service, managing a population of approximately 360,000. This study was an analysis of a smaller group of patients who underwent pain scoring from our prospective CTS database.[15] This study did not require formal ethical approval because it was classified as an audit according to regional guidelines.

There were 332 patients diagnosed and treated for CTS in our unit from January 2008 to December 2008. We excluded patients if they had undergone previous carpal tunnel decompression, they did not complete a pain questionnaire at presentation, or there were other missing data (n = 57). This left 275 patients over the study period (Table 1). A total of 183 were female (67%) and the mean age was 55 years (range, 22–87 y; SD, 13.8 y).

Clinical assessment

Demographic data were collected at presentation, including age, sex, hand dominance, occupation, body mass index, comorbidities, smoking, exposure to vibrating tools, and workers' compensation status. A total of 253 were right handed (92%), and 166 were bilateral