Comparative Responsiveness of the Michigan Hand Outcomes Questionnaire and the Carpal Tunnel Questionnaire After Carpal Tunnel Release

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Purpose The literature supports self-administered questionnaire assessment tools for the measurement of outcome after surgical treatment of carpal tunnel syndrome (CTS). Traditional physical measures are less sensitive to clinical changes following carpal tunnel release (CTR) than fully validated designed outcome questionnaires. A number of validated outcome instruments have been compared to determine which is optimal with regard to sensitivity and responsiveness following surgery. To our knowledge, the Michigan Hand Outcomes Questionnaire (MHQ) and the Carpal Tunnel Questionnaire (CTQ) have not been compared in regard to their responsiveness and sensitivity to change following CTR. The aim of this prospective study was to compare the responsiveness of these 2 instruments when evaluating outcomes after CTR.

Methods Seventy-eight patients diagnosed with CTS and scheduled for unilateral open CTR were recruited and informed consent was obtained after ethics approval. Inclusion criteria were primary procedure, history, clinical signs, and conduction studies consistent with CTS. The MHQ and CTQ were both completed by each patient preoperatively and 6 months postoperatively.

Results Results for all domains of the MHQ and all domains of the CTQ showed significant postoperative improvement. The overall responsiveness of both MHQ and CTQ were large (standardized response mean $\geq$0.8), however the CTQ demonstrated increased sensitivity to change after CTR compared to the MHQ. Although the standardized response mean (SRM) of the MHQ was 0.8, the SRM of the CTQ was 1.22. Both domains of the CTQ had an SRM well above 0.8, whereas half of the MHQ domains had an SRM below 0.8.

Conclusions The CTQ has demonstrated a greater responsiveness to clinical change following CTR than the MHQ. Therefore, the CTQ is a more sensitive instrument and researchers in the field of CTS should bear these findings in mind when choosing an outcome instrument for future studies. *(J Hand Surg 2009;34A:273–280. © 2009 Published by Elsevier Inc. on behalf of the American Society for Surgery of the Hand.)*

Type of study/level of evidence Diagnostic I.

Key words Carpal Tunnel Questionnaire, carpal tunnel release, carpal tunnel syndrome, Michigan Hand Outcomes Questionnaire, outcome, quality of life.

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Received for publication July 27, 2007; accepted in revised form October 22, 2008.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

This research project was performed in partial fulfillment of the requirements for the MSc in Wound Healing and Tissue Repair from Cardiff University. Diane Dobson assisted in the coordination of the research project and in making this research possible. Clinical supervisor Mr. M. Erdmann is thanked for his support during the project. Also, the staff at the University Hospital of North Durham are thanked for assistance in the running of this research project. The *Journal of Bone and Joint Surgery* is acknowledged for granting permission to use the Carpal Tunnel Questionnaire in the research project. The American Society for Surgery of the Hand is acknowledged for granting permission to use the Michigan Hand Outcomes Questionnaire in the research project.

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0363-5023/09/34A02-0011$36.00/0
doi:10.1016/j.jhsa.2008.10.021

CARPAL TUNNEL SYNDROME (CTS) is one of the most common upper-extremity disorders,[1] having an annual incidence of 99 per 100,000 population,[2] and is the most common presenting compressive neuropathy, with surgical decompression reported in approximately one third of cases.[3]

The development of "subjective" questionnaire outcome assessment instruments has allowed quantification of treatment effect in a standardized, reproducible manner.[1] Monitoring outcome is an essential aspect of patient care and furthermore is the foundation of evidence-based health care.[4]

In CTS, generic, regionally specific, and disease-specific instruments have been used to assess outcome after carpal tunnel release[5]; however, the generic instruments have been shown to be less sensitive,[6] resulting in widespread use of regionally specific and disease-specific instruments when evaluating outcome of carpal tunnel surgery.

Outcome assessment instruments have previously been evaluated on the basis of reliability and validity.[7] However, in the longitudinal assessment of health status, responsiveness, which is the degree to which an instrument is sensitive to change,[8] is critically important. Consequently, responsiveness of various instruments to clinical change after surgery has been studied to determine which instruments are most sensitive.[5,6,9]

At present, studies investigating different treatment options for CTS, such as endoscopic versus open surgery, often use 2 or 3 outcome assessment questionnaires.[10] This involves more time, storage facilities, and demand on patients than does use of 1 instrument. The lack of a standardized instrument for CTS also produces difficulties when comparing studies. Standardization of outcome assessment for CTS would allow outcome across studies to be compared.[4] Additionally, using the most sensitive instrument would reduce the number of participants needed in any one study. Which questionnaire to use in CTS is a question still to be answered.[9]

The 3 main hand-specific instruments that have been advocated to assess outcome in carpal tunnel surgery are the Carpal Tunnel Questionnaire (CTQ), the Michigan Hand Outcomes Questionnaire (MHQ), and the Disabilities of the Arm, Shoulder, and Hand Questionnaire (DASH). It should be emphasized that the CTQ was designed as a disease-specific instrument assessing CTS,[11] whereas the MHQ and DASH were designed to assess the upper extremity comprehensively.[12–14] The responsiveness of the CTQ has been compared with that of the DASH,[6] and the MHQ has been compared with the DASH.[9] However, the CTQ and the MHQ have to date not been compared against each other in the literature.

It is essential that all instruments are directly compared regarding their responsiveness to provide an evidence-based platform from which researchers can choose the optimal instrument. This study compares the relative responsiveness of the CTQ and MHQ after carpal tunnel surgery and in effect completes the comparative efficacy of these 3 instruments; it may potentially provide an indication of which instrument to use in future research regarding treatment of this common condition.

Additionally, it is beneficial to be able to compare various conditions within the upper limb using 1 scoring system. The MHQ is regionally specific and has a broader application than does the generic CTQ. Comparing these instruments may demonstrate the responsiveness of the two to be both large and similar in the relevant domains regarding pain and function for each instrument, thereby providing evidence for use of the MHQ when comparing various upper-limb conditions that include CTS in contrast with research investigating CTS alone.

MATERIALS AND METHODS

To compare the responsiveness of the MHQ and the CTQ to clinical change after carpal tunnel surgery, both outcome instruments were presented to patients having carpal tunnel surgery at the University Hospital of North Durham. By using 1 cohort, and both instruments being completed by each patient, the sample, surgeon, and severity of disease were the same for those completing the MHQ and CTQ. This is the method used by most studies to date when comparing responsiveness of outcome instruments in CTS.[1,5,6,9]

By assessing the change in score for each instrument after surgery, it would be possible to determine which instrument is most responsive. Correlation between scale scores as well as physical measures have also been used previously to assess responsiveness.[11] However, traditional physical measures (eg, strength, sensibility, and motion) are less sensitive to clinical changes that occur in patients who have carpal tunnel surgery than properly designed outcome questionnaires,[5] and therefore physical measures were not measured in this study.

There are 2 approaches to assessing responsiveness: a correlation approach or responsiveness indices, developed to evaluate the responsiveness of outcome instruments.[8] Most studies regarding CTS have used responsiveness indices rather than the correlation method, which has been portrayed as a rather crude estimation