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Overall health status in patients with mild to moderate carpal tunnel syndrome: A case-control study

Tomasz Wolny PhD [a,b], Pawel Linek PhD [a,*], Edward Saulicz PhD [a,b]

[a] Department of Kinesiotherapy and Special Methods in Physiotherapy, The Jerzy Kukuczka Academy of Physical Education, Katowice, Poland
[b] Department of Physiotherapy, The Academy of Business, Dąbrowa Górnicza, Poland

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ABSTRACT

Study Design: A case-control study.
Introduction: There are no reports in the literature that evaluate the overall health status (OHS) of patients with mild to moderate forms of carpal tunnel syndrome (CTS) using 36-Item Short Form Health Survey (SF-36).
Purpose of the Study: To assess OHS in patients with mild to moderate CTS, in comparison with healthy subjects.
Methods: The study involved 273 healthy people and 140 people diagnosed with CTS. The CTS diagnosis was made on the basis of clinical examinations and nerve conduction studies. OHS was assessed using the SF-36.
Results: In the assessment of physical components of OHS, in the CTS group (compared with healthy subjects), the results show significantly lower values in physical functioning, role limitations because of physical health problems, bodily pain, and general health perceptions by 7.44, 23.2, 18.9, and 4.1, respectively. Mental components were lower (in CTS group) only in relation to vitality and social functioning by 4.1 and 5.5, respectively. In the assessment of physical component summary (PCS) and mental component summary (MCS), the results show significantly lower values of PCS (by 13 in CTS group) and no significant differences in the assessment of MCS between patients with CTS and healthy subjects.
Discussion: The perception of the OHS in CTS patients is diminished. Hence, when evaluating the effects of the therapy, not only disease-specific scales should be used, but also the OHS. This will allow an assessment of the impact of CTS on OHS and the impact of applied therapy, not only in terms of a reduction in the main symptoms of the condition.
Conclusions: Mild and moderate forms of CTS significantly affected the PCS of the OHS and all its subcomponents (physical functioning, role limitations because of physical health problems, bodily pain, and general health perceptions) but did not affect the MCS of OHS evaluated as a whole. There were significant differences in the mental component in the evaluation of vitality and social functioning.
Level of Evidence: 3.

Introduction

Carpal tunnel syndrome (CTS) is the most common neuropathy of the peripheral nervous system. Its incidence, reported by numerous authors, varies within the range of 1.5%-3.8%.[1-3] CTS is characterized by the presence of many symptoms.[4] Sensory disorders tend to appear first (paresthesia and numbness) and then motor disorders (muscle weakness and loss of efficiency of the hand). The condition leads to significant impairment of sensory and motor functions of the hand, which have a direct impact on professional life and the activities of daily living.[4]

CTS is also characterized by high variability in the symptoms.[5] The initial stage of the disease is associated with the occurrence

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* Corresponding author. Department of Kinesiotherapy and Special Methods in Physiotherapy, The Jerzy Kukuczka Academy of Physical Education, Mikolowska 72B, 40-065 Katowice, Poland. Tel.: +48 661 768 601.
E-mail address: linek.fizjoterapia@vp.pl (P. Linek).

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of certain subjective feelings, which can be measured objectively only after some period.[6] Most commonly, the diagnosis of CTS is based on data gathered from an interview, in which the patient has the following symptoms: night paresthesia, numbness, and tingling in the area of the median nerve.[7] The diagnosis is frequently confirmed by a Phalen's test or Tinel's sign,[7,8] which are commonly performed during an examination. The nerve conduction study (NCS) is considered to be the gold standard in the diagnosis of CTS.[9] In the diagnosis and assessment of the effectiveness of CTS therapy, muscle strength, range of motion, sensory threshold, and 2-point discrimination are often measured[10-13] because these variables are disrupted in the presence of CTS. Such a plurality of symptoms may affect the functioning of patients with CTS, which can affect their overall health status (OHS).

In clinical examinations and scientific research, also disease-specific subjective questionnaires and scales, such as the Boston Carpal Tunnel Questionnaire (BCTQ) or the Historical-Objective (Hi-Ob) Scale, are helpful in CTS patient management.[14-16] The most commonly used is the disease-specific BCTQ as it assesses the severity of symptoms and the functional status of upper extremities in subjects with CTS.[14] It is considered by many authors to be one of the most reliable, dependable, and thorough research tools with which to assess CTS.[17-20] Some researchers, however, claim that the BCTQ does not determine the impact of CTS on the OHS and should therefore be supplemented with another scale, such as the 36-Item Short Form Health Survey (SF-36) questionnaire, which assesses both physical and mental components of OHS.[21-24] Generally, the SF-36 questionnaire is the most widely used measurement tool to evaluate OHS.[25] It is assumed that the SF-36 questionnaire is a reliable research tool[26,27] that can be successfully used in conjunction with disease-specific scales (eg, the BCTQ for CTS).[18]

To date, OHS has been assessed in association with many peripheral neuropathies and other hand dysfunctions.[28-34] It has been shown that, compared with the healthy population, the quality of life was diminished in patients with ulnar nerve tunnel syndrome and median nerve dysfunction (due to diabetes mellitus), as well as in patients with hand osteoarthritis and rheumatoid arthritis.[28,29,32] Vickrey et al[31] have claimed that in patients with peripheral neuropathy, the correlation between quality of life and patient signs is greater than the correlation between examination and electrophysiological test results. Slatkowsky-Christensen et al[32] suggested that decreased hand dexterity and strength was connected with worse scores on all assessed dimensions of subjective health status measured by the SF-36. In a systematic review, Jensen et al[33] assessed the influence of neuropathic pain on the quality of health in both peripheral (postsurgical neuropathic pain associated with breast and amputation surgery, postherpetic neuralgia, and painful diabetic neuropathy) and central (poststroke pain, spinal cord injury pain, and multiple sclerosis pain) neuropathies and found a high correlation between neuropathic pain and many health quality domains. These authors also highlighted that such findings imply that not only a biomedical but also a biopsychosocial approach to patient treatment is necessary.[33] In another systematic review, the authors confirmed significantly lower health quality in inflammatory neuropathy patients compared with healthy controls.[34] Rajabally and Cavanaa[34] also noted that there are few studies examining the influence of different neuropathy treatment methods on quality of health. They recommended that in addition to a specific-disease scale, the OHS scale should be used during examination of patients with peripheral neuropathies.[34]

Although the symptoms and clinical course in mild and moderate forms of CTS are well known and documented, their impact on OHS has not been sufficiently studied. Treatment in the advanced stages of CTS is most often associated with surgery, whereas mild and moderate forms of CTS are treated conservatively by physical and occupational therapists.[35] CTS as a chronic and deteriorating problem shows many subjective and objective signs for many years, which may trigger physical, psychological, sociologic, and economic negative consequences. The OHS examination thus seems important in CTS treatment for patients themselves and the rehabilitation team because information about physical and psychological domains may initiate more comprehensive treatment.[36] By using specific-disease scales in CTS management, specific signs and dysfunctions are only examined and further considered during treatment. An additional tool assessing the OHS in CTS management will bring new information about elements, such as vitality (VT), social role functioning (SF), role limitations because of emotional problems (RE), and mental health (MH), which are currently (using only specific-disease scale) usually omitted.

There are no reports in the available literature that evaluate OHS (using the SF-36 questionnaire) in patients with mild to moderate forms of CTS, in comparison to healthy subjects. Taking into account the need for a biopsychosocial approach to patient treatment, and the recommendation that the OHS scale should be used in the management of patients with peripheral neuropathies,[33,34] this is the first study that evaluates the impact of mild and moderate forms of CTS on the OHS. We hypothesized that a multitude of symptoms, such as pain, tingling, numbness, paresthesia in the hand both at night and during the day, and sensory deficits in the area of the median nerve innervation, significantly affect the OHS of people with CTS, in comparison to healthy subjects. The enrichment of diagnostics by testing the OHS may provide valuable information about the impact of CTS patient perceptions of well-being. The purpose of the present study was thus to assess the OHS in patients with mild to moderate CTS in comparison to healthy subjects. The following questions would be addressed: (1) How does the mild and moderate form of CTS affect the physical health of the examined subjects? (2) How does the mild and moderate form of CTS affect the MH of the examined subjects?

Materials and method

Study design and setting

This was a case-control study conducted in the Silesian region of Poland. Patients with CTS were selected from 2 medical clinics from 2007 to 2012 and were included in the case group. Data from the case group were collected during baseline assessments for a controlled trial, which investigated the effect of physiotherapy on CTS symptoms (ACTRN12614000367640). The control group was randomly selected from the general population at the same time and in the same region. The study was designed according to the Declaration of Helsinki and was approved by the local ethics board. Informed consent was obtained at the time of enrolment.

Participants

Inclusion criteria for participation in the case group were as follows:

1. CTS diagnosed by a physician.
2. The presence of 2 or more of the following positive symptoms[8]: (1) numbness and tingling in the area of the median nerve; (2) night-time paresthesia; (3) positive Phalen test; (4) positive Tinel sign; and (5) pain in the wrist area radiating to the shoulder.
3. Diminished nerve conduction values (below 50 m/s) and/or increased motor latency (above 4 m/s) in an NCS.
4. A score of 1-3 on the Hi-Ob scale, which confirms mild and moderate forms of CTS.[15,16]