

Work Related Upper Limb Disorder (WRULD): Assessment and Treatment

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Abstract

Background: The 'typing capacity cycle' test (first typing period + recovery time) for keyboard users was first developed as an assessment tool for predicting and re-evaluating functional work capacity in patients with both acute and chronic work-related pain with respect to the use of the keyboard only (Povlsen et al, 2004).

Objectives: This paper evaluates the results of the 'typing capacity cycle' tests of keyboard users who remain at work, before and after rehabilitation, to determine it's effectiveness in assessing functional work capacity and to determine if the degree of mouse use has an influence on the treatment outcome.

Method: Patients were referred to a specialist hand and upper limb clinic because of the development of non-traumatic upper limb pain in relation to keyboard and mouse use. Each patient was assessed using the 'typing capacity cycle test' to establish the levels of pain related to keyboard use only as the test does not assess the effect the mouse has on pain. The results of the 'typing capacity cycle' tests were analysed to determine any improvements made following rehabilitation.

Results: Patients presented with a long history of work related pain prior to referral. Most of the patients had lower resting pain scores and lower typing pain scores during their 'typing capacity cycle' test following rehabilitation. Averages of 5-11 treatment sessions were required over a period of 4 to 10 months.

Conclusion: These results confirm the effectiveness of the 'typing capacity cycle' test as a representation of functional work capacity for keyboard

users. The intensity of mouse use did not influence the level of initial pain scores or the outcome following treatment.

Introduction

Work Related Upper Limb Disorders (WRULD) can be categorised into two types; Type I refers to localised, clearly defined syndromes such as Carpal Tunnel Syndrome, de Quervain's Syndrome and Lateral Epicondylitis. Type II conditions are far more difficult to diagnose and have vague definitions for example Regional Allodynia or Hyperalgesia (1, 2). The difficulty in diagnosing Type II WRULD is partly due to the fact that no specific clinical or objective tests are available and, as a consequence the diagnosis is based on exclusions. As a result the diagnosis is often delayed and the condition becomes chronic by the time treatment is initiated. WRULD is a condition, which is becoming increasingly common as the use of keyboard-based work dominates the 21st century workforce. When employees first begin to experience work related pain, they are often reluctant to reveal such symptoms to their employer. As a result, employees are hesitant to take time off work for the assessment and management of their pain for fear of losing their position in their corporation. Conversely, employers that are aware of their employee's situation are often reluctant to allow the employee to continue with their usual work duties due to the fear of litigation if their condition worsens whilst they are still working. This catch 22 situation is further compounded by the limited availability of scientific evidence that can provide the public with guidelines on how to effectively manage work related pain whilst remaining at work.

The Typing Capacity Cycle Test for keyboard users with Type II WRULD was first described by Povlsen et al in 2004. This test was developed as an assessment tool that could predict true work capacity and evaluate functional performance following rehabilitation of patients with both acute and chronic work related pain.

The reported 'typing capacity cycle' test was used on a group of healthy keyboard-based users in order to establish a normative baseline between healthy and non-healthy individuals. The test did not include the mouse and therefore does not provide an evaluation of the impact mouse use has on pain. The test was well tolerated by normal healthy individuals and was well within the guidelines for VDU workers in England as outlined by the Health & Safety Executive, 1992 (4). The assessment of the control group showed that the test is unlikely to cause pain in pain-free individuals. Individuals with WRULD who had pain at the onset of the test, and who did not exceed 30 minutes of typing or increase their pain to a maximum of VAS 5 before they stopped typing, did not have any long lasting increase in pain. There was also the suggestion that those individuals with severely impaired typing endurance also have an impaired recovery capacity – therefore having a 'double negative impact effect' on their work capacity.

In addition to the description of the 'typing capacity cycle' test, a non-surgical treatment programme for the treatment of Type II WRULD was described (3).

Methods

The 'typing capacity cycle' test (3) was conducted at a standardised workstation in the Occupational Therapy Department. The test was carried out before the first treatment session and after a minimum of 3 months of treatment.

At the start of each test the patient was requested to score their resting pain, termed 'START LEVEL' on a visual analogue scale (VAS, 0-10).

They would then start to type a standard document at their own speed for a maximum of 30 minutes or until the VAS reached 5. If they managed the 30 minutes they would then score their VAS level. For these individuals the typing component of the test was considered completed. If however, their pain during the typing reached a VAS level of 5, they were instructed to stop typing and the length of the typing period was recorded. Following the 1st typing period they would then carry out stretching exercises until the pain level returned to the start level and the time for this to take place was recorded. Once this had occurred those who did not manage 30 minutes in the 1st period would then start typing the 2nd period until they again reached VAS 5, and this second typing period duration was also recorded. This was followed by final stretching exercises until the pain level returned to the start level and the time for this to take place was recorded. The actual and relative typing speed, taking the length of the recovery period into consideration, was then calculated.

Following the initial 'typing capacity cycle' test patients were screened for signs and symptoms relating to poor posture, neck tension, upper limb muscle weakness, peripheral nerve hypersensitivity, nodules, swelling or any abnormal movement patterns whilst performing functional tasks, including typing. The exercise component of the rehabilitation programme was designed to make patients aware of their posture; strength and flexibility as well as encourage them to constantly move and avoid prolonged static positioning. The exercises were simple and aimed to maintain neck range of motion, prevent neck protrusion, improve trunk, thoracic and upper extremity mobility. Specific forearm stretches were performed along with nerve glide exercises if peripheral sensitivity was observed (5). Patients were encouraged to incorporate all of the exercises into their day by selecting which ones were best to perform at home and which ones to perform during the day at work. The 20-20-20 rule was encouraged i.e. perform an exercise/ stretch every 20 minutes for 20 seconds and look 20 yards beyond their monitor screen. Patients were also encouraged to limit caffeine, drink plenty of water and structure their environment so that it became necessary for them to get up from their desks regularly throughout the day. Therapeutic materials such as Theraband and Theraputty were provided to assist with stretching and strengthening whilst working.

Results

All participants remained at work full time during the implementation of

the treatment programme. The results demonstrate that the patients enrolled in this study covered a broad spectrum of resting pain severity ranging from none to moderate pain (VAS 4). Despite the continuation of work during rehabilitation, few of the patients had an increase in resting pain. However, the score were still described mild pain (VAS 3) and all of the patients had resting pain scores of less than VAS 3 following rehabilitation.

In addition to the reduction of the resting pain, in most of the patients had a reduction in their typing pain but all patients increased their typing capacity (relative typing speed, which accounts for rest periods) by an average of 47%. This demonstrates a marked reduction in pain and significant increase in work capacity following rehabilitation.

The duration of treatment ranged between 4 and 10 months and the mean range of treatment sessions that was required was 5-11. Patients tended to need intensive treatment in the early stages of intervention as they learnt to adapt to their new lifestyle, but as the programme progressed only brief follow-up sessions were required to maintain motivation and to re-assess functional ability.

Conclusion

We would like to conclude that on the balance of probability a group of patients diagnosed with Type II WRULD who have resting pain levels of less than VAS 5, who remain in full time VDU-based work during a minimum of 3 months treatment programme as out lined above are likely to benefit from such treatment.

References

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