

Writer's cramp: therapeutics perspectives

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Abstract: Writer's cramp has been recognized for at least a century, yet its treatment remains unsatisfactory because it doesn't have a specific therapeutic proposal. The use of drug therapy that act in a systemic way like GABA agonists and anticholinergics have not been found to be of reliable pharmacological benefit.

The latest attempt to treat writer's cramp has employed botulinum toxin. The use of splints can bring new results for the motor recovery of writer's cramp.

Key Words: writer's cramp; focal dystonia; perspectives; therapeutics

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Writer's cramp: Therapeutics Perspectives

An unfortunate use of the descriptive term “professional neuroses” to describe this disorder and other similar and task specific conditions, led to the mistaken belief that writer's cramp was due to a mental condition rather than motor pathology [1].

In 1893 Gowers described the symptoms: “the pen does not move as quite as intended...a slight involuntary movement causes an unintended mark...now and then there is a distinct spasm, which cannot be controlled” [2].

According to Tsui et al in 1993 [3], writer's cramp is characterized by involuntary muscle contraction and may be painful in the upper limb when the patient writes, despite normal control of the limb in performing other activities. This may be associated with contortion of the wrist, elbow and shoulder. Data from Nutt et al in 1988 shows a prevalence of 69 per million [2], and the prevalence may have decreased with the advent of the computer [1]. It seems mainly to affect people who do a lot of writing [4].

Diagnosis

There are no specific clinical laboratory tests to confirm the diagnosis of focal hand dystonia. However, loss of inhibition, excessive muscle firing, and inability to release muscle contractions are documented with electromyography (EMG) [5]. Examination of the reciprocal inhibitory mechanism between extensor and flexor forearm muscles may reveal reduction or absence of inhibition of the terminals relating to the flexor muscles [2].

The positron-emission tomography (PET) technique has been used to show metabolic activation of the basal ganglia and cortical areas [6].

Patients with target-specific dystonia usually undergo a neurological examination that generally includes testing of the patient's performance in various functional activities. Observation of the onset of abnormal movements is essential in the diagnosis of focal hand dystonia. The loss of inhibition between agonist and antagonist muscles and abnormal patterns of neural stretching may be analyzed through this study (Byl et al *Case Series*) [5].

Treatment

Clinical

Anticholinergic agents are employed in the treatment of this disorder and should be used in low doses. Other medications like GABA agonists, anticonvulsants, and atypical neuroleptics are part of the therapeutic arsenal [7].

The introduction of botulinum toxin has revolutionized the treatment of focal dystonia. The duration of treatment effect for both botulinum toxin types (A, B) is approximately 3 to 4 months [7]. The toxin may act directly on the central nervous system

by blocking the release of acetylcholine from other neurotransmitters. Priori et al in 1995 [12], and Artieda et al in 2001 [8], showed that the toxin reverses alterations in the spinal reciprocal inhibition. The use of botulinum toxin in the muscles compromised may normalize patients' cortical maps through a central action.

Non Clinical

In 2003 Byl et al [5] showed that innovative therapeutic programs have been emphasizing the principles of neuroplasticity, but if the behavior became stereotyped and very close, the brain may not be able to distinguish the changes accurately.

The first step is to alter the grip of the pen. Another way would be the use of an artifice to write [2].

In 2003, Chamagne [9] developed a study based on rehabilitation of musicians plagued by dystonias. Anatomic factors such as joint laxities may be a source of disappointment. If patients suffer from some articular instability, it is necessary to modify the angle to compensate for the deviation [9]. The program seeks to make patients conscious of their stereognosis and increase muscle strength. Zeuner et al in 2004 [10] established a motor training program to improve focal hand dystonia through the decrease of abnormal synergy ("overflow" phenomenon).

Tas et al in 2001 [11] initiated physical therapy treatment in patients with claims of functional loss. The use of splints at rest may be useful as an aid when there is extreme tension in the forearm and hand muscles. Splints can be made to correct hyperflexion of the distal interphalangeal joint [9].

Upper limb immobilization showed significant improvement of dystonia and motor performance [12]. This finding is in keeping with the observations of Candia et al (1999), and Artieda [8], in which the finger immobilization plus rehabilitation markedly improved focal dystonia. With opposite data, Liepert et al in 1998, and Priori et al in 2001 [12], limb immobilization in a non dystonic person leads to a decrease in cortical motor representation. This fact confirms a recent study that showed improvement of focal dystonia focal after motor fatigue [12]. Treatment of focal dystonias may be the beginning of sensory retraining to restore the cortical organization and representation of the fingers [13].

A study of focal hand dystonia using the learning of Braille reading as a form of sensory training showed improvement in sensorial processing [10].

Cortical magnetic stimulation tends to normalize the alterations of intracortical inhibition and symptoms [8].

Physical modalities like relaxation techniques, stretching and conditioning exercises in addition to electrotherapy, may act simultaneously with drug therapy [11].

Tinazzi et al in 2005 [14] did a study with transcutaneous electrical stimulation (TENS). Results showed improvement of the dystonic symptoms through remodulation of excitatory and inhibitory relationships between agonists and antagonists muscles.

Conclusion

Due to limitations and variations of pharmacological therapeutics splints have been suggested as an alternative for plagued upper limbs, especially for focal hand dystonia.

The hypothesis that after immobilization changes in cortical plasticity occur, and that these changes contribute to the improvement of dystonia has received backing from recent studies observing the improvement after motor fatigue, which transitorily minimize and remodel the cortical motor areas.

The realization of prospective studies is necessary to observe the long-term clinical evaluation of this disorder.

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Case Study

This study is in agreement with the Resolution 196/96 of the National Counsel of Health, and was approved by the Ethics Committee of the Pedro Ernesto Hospital (State University of Rio de Janeiro). Prior to the beginning of the study, each participant signed the free and informed consent after the verbal explanation of the motor recovery program. This study was conducted in two phases, duration of four weeks each, two sessions per week for 60 minutes.

Patient shown in Figures 1-3 is of male gender, 24 years of age, occupation lawyer, with claims of 6 years of feeling weakness and tremor sensation in the right hand. In the last three years writing difficulties presented after writing a few hours, however without stopping the writing.

Writing on a blackboard was not affected. Neither was using a computer. As for adaptation to writing, tried thick pens with eraser wrapper in down extremity which led to greater stability of fingers. The dystonia consisted in extension of the metacarpophalangeal joint of the right index finger with upper displacement of distal phalanx on the pen as the patient began to write. The grip of the pen was between the index and thumb, which stayed in extension and abduction. In 2005 used clonazepam and botulinum toxin without other concomitant therapy.



Patient showing dystonic posture of the right index before the motor recovery writing program.

Figure 1

Proceedings

In the first phase of the program physical modalities were used, relaxation techniques, body awareness, stretching, motor and sensory training for four weeks. At the end of this phase, protocols were applied to evaluate the dystonia, including functional tests of plagued muscles for evaluation of motor dysfunction.

In the second phase of the program specific splints were used on the plagued hand muscles in association with a hand skills program for writing exercises.



Patient with splints on index and thumb during the writing training.

Figure 2

After training program

There was marked decrease in the movement of extension of the metacarpophalngeal joint of the right index finger, which demonstrates evidence of a greater motor control. There weren't dystonic postures in relationship to the extension of the index finger, nor was there pressure to grip the pen.



Image of manual writing posture after the writing motor program recovery.

Figure 3

In a written report, the patient stated that he had 80% improvement in the development of writing in relationship to the quality of writing, due to the awareness of body posture and increased motor control in the handling of the pen. The patient further stated that after he was conscious of his posture, he established a linear relationship between quality of writing and emotional influence. In relaxed situations the quality of writing was better, whereas the opposite occurred in stressful situations.