

Paramedical treatment in focal dystonia's; current evidence and future research

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Current evidence

Dystonia is a disabling movement disorder with still a largely unknown pathophysiology. Treatment is mainly aimed at the relief of symptoms and pain. During the last few decades tremendous progress has been made in the medical treatment by botulinum toxin (BTX) injections and deep brain stimulation. Although these treatment options reduce involuntary muscle contractions, pain and correct abnormal posturing, many patients still experience difficulties with performing daily life activities and participation in work, family and society. To overcome these problems many patients are referred for physiotherapy besides their medical treatment to overcome these problems. However, evidence for the effects of paramedical interventions is lacking. (Delnooz, Horsting, Tijssen *Mov Dis* 2009) Many studies investigating these effects are case reports or uncontrolled, unblinded studies with relatively few participants each promoting different strategies and techniques often emerged from a practical point of view rather than a pathophysiological basis. So currently there is no consensus on the best paramedical treatment options for dystonia.

Despite the poor methodological quality of most studies, there are some, more recent, promising studies of moderate methodological quality which might have future therapeutic implications. These include studies for laryngeal dystonia, writer's cramp or task specific hand dystonia and cervical dystonia. (Tassorelli et al. *Move Dis* 2006, Queiroz et al. *Functional Neurology* 2012, Berg et al. *Neurorehab* 1999, Murry et al. *Journal of Voice* 1995, Silverman et al, *Journal of Voice* 2012) The main similarity between these studies is that they all include specialized training programs aimed at motor (re)learning to reduce abnormal movement or postures in combination with BTX injections. Most of these studies, showed a decrease in disability, less pain and a longer duration of the BTX effect the combined BTX and training program group compared with BTX alone.

Another promising feature of these training programs is that is thought they affect some basic features that are identified in adult-onset focal dystonia. Several studies showed excessive neuroplasticity in patients with focal dystonia which could drive the maladaptive reorganization of cortical sensorimotor maps thought to underly the generation of dystonic movements (Cassidy et. *ACNR* 2010).

With exercises aimed at motor (re)learning to reduce and replace abnormal movements and postures, such defective mechanisms might be corrected. So in fact therapists are retraining the brain. These basic features therefore might form the pathophysiological basis for the rehabilitation of focal dystonia's. (Lansek et al. *Rehabilitation in Movement Disorders*, Cambridge University Press 2013) The results

of these studies however are variable and further research towards the right intensity, frequency, and moment of training needs to be done.

Future research

To overcome the methodological deficits large scale, well designed studies with clear descriptions of the applied interventions and valid and reliable outcome measures are needed. Furthermore feasibility, validity and cost-effectiveness of rehabilitation programs should be further investigated. In a ongoing RCT towards the effectiveness of a standardized physical therapy program in cervical dystonia we try to overcome some of these problems to increase the evidence for rehabilitation methods in focal dystonia. (van den Dool et al. BMC Neurology 2013)