Radial extracorporeal shock wave therapy (rESWT) in the treatment of spasticity in cerebral palsy: a preliminary report.

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Device and producing company:
Swiss Dolor Clast, EMS

Introduction:
Spasticity is a disorder of excess muscle tone associated with central nervous system disease. Cerebral palsy (CP) is a central nervous system deficit resulting from a non progressive lesion in the developing brain. Although the brain lesions are static, the movement disorders that arise are not unchanging and are characterized by atypical muscle tone, posture and movement. The spastic motor type is the most common form of CP and its conventional therapeutic management may include splinting/casting, passive stretching, facilitation of posture and movement, spasticity-reducing medication, botulinum toxin and surgery (Wasiak 2004). ESWT reduces hypertonia of the wrist and finger muscles in patients affected by stroke (Manganotti 2005). The aim of this initial experience was to evaluate the effect of radial extracorporeal shock wave therapy (rESWT) in the treatment of spasticity in patients with cerebral palsy.

Methods:
In April 2008, 3 patients with spastic cerebral palsy, 2 men (34 and 48 years old) and 1 woman (42 years old), were treated with rESWT. The patients were treated in 1 session only. The muscle groups were the following: biceps, wrist flexors and triceps surae in all patients and the thenar eminence in a sole patient. Number of impulses: 2,000 in each muscle group. Device used: Swiss Dolor Clast (EMS-Switzerland). Energy flux density: 0.10mJ/mm2. Spasticity was evaluated by the Aschworth Scale from 0 to 4 (0 = no spasticity to 4 = severe spasticity) in each muscle group. Passive elongation of the triceps surae was also measured with a goniometer. Evaluation was performed immediately before treatment and immediately after, on the next day and 4 weeks after treatment.

Results:
All the patients reduced spasticity immediately after treatment and in all muscle groups. On the Aschworth Scale there was an average reduction of 3 to 1(+). Passive elongation of the triceps surae increased by 5 degrees. The following day, spasticity returned to initial values in the upper extremity. Gains achieved in the lower extremity continued to the following day and one month later. These side effects were observed: small superficial hematoma (1 biceps), and petechiae (1 biceps). All side effects were tolerated by all the patients and disappeared after 1-7 days. At the end of follow-up, all the patients were asked to assess if they would repeat the experience and all of them said yes.

Conclusion:
rESWT reduces spasticity of the triceps surae immediately and a month after treatment. rESWT reduces spasticity of biceps, wrist flexors and thenar eminence immediately after treatment, but the benefits are not retained the following day. Further randomized and controlled studies are necessary to underline the results of this initial experience.