

## Introduction

Spasticity is a frequent complication in neurological disease which causes chronic neuropathic pain, sensory disorders, bone deformities, fibrosis of muscle fibres, it interferes with daily life by impairing physical capabilities. Its prevalence is linked to associated pathology; it is estimated that it affects around 20-40% of survivors of stroke after 12 months, 60-90% of people with multiple sclerosis, 60-78% of people with spinal cord injuries. Selection of a treatment plan is complicated and different therapeutic strategies are used to modulate muscle tone.

## Objective

The objective of this review is to collect and analyse the available scientific evidence on the effectiveness of shock wave therapy (ESWT) as a treatment for spasticity.

## Materials and Methods

The study was based on systematic research carried out in PubMed, including systematic reviews, meta-analysis and studies published until May 2025

## Results

A total of 20 studies were selected for inclusion in this review and some studies used shock therapy in comparison with a programme of conventional rehabilitation, another applied shock wave therapy versus treatment with BTA on patients with spasticity to evaluate its effect on motor function, motor impairment, pain and functional independence. In a study the patients were randomly assigned to botulinum toxins Btx+ESWT and Btx alone groups. The modified Ashworth scale (MAS) of both groups before treatment and during the follow up period showed a statistically significant decrease at 3 weeks, but the Btx+ESWT group showed additional improvement in finger flexor spasticity. Regarding motor function studies found statistically significant improvements using different tools: passive range of movement (PROM), active range of movement (AROM) and the gross motor function classification system. Pain, assessed with the Pain caused spasticity (QPS) and visual analogue scale (VAS), improved during treatment with ESWT. The results, finally, were significant and improvements in functional independence. These studies revealed that the treatment with extracorporeal shockwave therapy can relieve upper and lower limb spasticity

## Discussion

The results suggest that shock wave therapy could reduce levels of spasticity. The mechanism of action of shock wave therapy could be related to a direct modulation of the rheological properties of the spastic muscle. The studies apply different protocols, but the evidence shows that there is no relationship between the number of shots and the therapeutic effects for reduction of levels of spasticity. The evidence indicates how the effects of the shock waves could reduce localized ischemia in areas of muscle shortening, reducing in turn the secretion of various substances that induce pain, and inhibiting inducing of pain due to stimulation of the nociceptors of the affected muscle.

## Conclusioni

The results of this review show a clear positive impact of shock waves on motor function, motor impairment, functional independence, and the resulting improvement in activities in daily life, regardless of the form of measurement of those variables.

## Topic References

-Martinez, BM, Semperio-Rubio, N, Navarro, O, Faubel, R,

-Effectiveness of shock wave therapy as a treatment for spasticity: A systematic Review - Brain Sci - 2020 - 11 - 15 Lee, J, Yang, SN. Effectiveness of extracorporeal shock wave therapy Pag. 1 Extracorporeal shock wave therapy as a treatment for spasticity: Review after botulinum toxin injection for post-stroke upper extremity spasticity: A randomized Controlled Study. - Toxins - 2024 - 16-197 Bavikatte, G, Subramanian, G, Ashford, S, Allison, R, Hicklin, D,

-Early identification, intervention and management of post-stroke spasticity: expert Consensus Recommendations - J. Cent. Nerv. Syst Ds - 2021 - 13 - 117957355211036576



24-28 Ottobre 2025  
Padova Congress

55° CONGRESSO  
SOCIETÀ ITALIANA  
DI NEUROLOGIA