

## Is prolonged stretching effective in the treatment of contracture in spinal cord injury patients: A randomized controlled trial

Chan JPG; Ronquillo JR; Manlosa MS; Gaba MCC; and Reyes MD

### ABSTRACT

**Objectives:** Stretching is commonly used in treating and preventing contractures. In this assessor-blinded randomized controlled clinical trial, the authors aim to determine if one hour of stretching applied in regular short bouts throughout the day is effective in increasing ankle dorsiflexion range in spinal cord injury patients. **Methodology:** Eight ankles of four male spinal cord injury patients with paraplegia and quadriplegia were randomized into experimental and control groups. Experimental ankles were stretched towards dorsiflexion for one hour broken down into two to three stretching sessions per day. This was done 5 times a week with a 28 Nm torque for 6 consecutive weeks. Control ankles received no stretch. Passive ankle dorsiflexion range for both legs was obtained at baseline and after the 6<sup>th</sup> week. **Results:** The stretching intervention did not increase ankle dorsiflexion range (mean change was 4 degrees with a 95% CI of -1 to 9 degrees). Intra-tester reliability showed consistency of measurements. No significant changes were noted between measures on 3 occasions ( $p > 0.05$ ). **Discussion and Conclusion:** One hour of daily stretching broken down into short bouts for six weeks is ineffective in increasing ankle mobility in SCI patients. However, the results of this study cannot be generalized because of the limited sample size.

**Key words:** spinal cord injury, stretching, contracture

### COMMENTARY

Spinal cord injury (SCI) results in significant physical and social dysfunction. With life expectancy becoming longer, considerable research is required in providing better long-term care for SCI survivors. Thus, there is a need to constantly re-evaluate common physical therapy procedures used in managing SCI and question their efficacy.

The results of the paper did not offer any conclusive evidence to support or refute the use of prolonged stretching in managing contractures in spinal cord injured patients. The obvious limitation of a small sample did not allow any generalization or possible correlation of the data. However, it is commendable that the paper presented a very clear and simple methodology as regards the research question presented. The reliability of measures was also an important factor that was addressed in the paper. Proving this as the strong point of the paper, it would be easy to replicate the study in the future and thus provide a good foundation from which other researchers can continue on.

The paper cited animal studies in providing a background to the study. However, the author/s needed to present a more in-depth critique of the

cited references by relating the references tightly to their chosen topic. The readers of the paper would have wanted to know if there was a difference in the morphology between animal and human muscle/tendon unit.

The choice of using the "cyclic" one hour stretching protocol was not really justified in the paper. The authors recognize that an increased stretch force may be needed to effectively stretch contracture in SCI patients. However, the paper did not consider that the subjects chosen were in the chronic stages and thus would present with both motor neuron dysfunction as well as musculoskeletal impairments. Kubo et al.<sup>1</sup> found that a passive, static 10 minute stretch of the ankle dorsiflexors in healthy male subjects decreased tendon viscosity and increased tendon structure elasticity. The paper did not clearly state as to how long the duration of each stretching session the subjects had, the chronicity of the SCI of the subjects would have presented unique viscoelastic properties of the muscle tendon unit. Such a situation may require a different approach than the conventional in terms of warranting changes in the passive range of movement of the ankles of the subjects.

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The direction for most physical therapy procedures is towards an individualized management program. Though there is merit in applying protocols for consistency, the success of SCI rehabilitation may lie in approaches that induce plastic changes in both the central and peripheral system<sup>2</sup>. This would mean that physical therapists would need to develop excellent clinical reasoning skills in order to identify the specific cause and contributing factors to a patient's presentation and develop a physical therapy program that would address these specific factors and ensure that treatments are relevant to the patient's needs.

**Jeric Uy, PhD, M App Sc, PTRP**

*Research Officer*

*National Centre for Culture & Recreation Statistics*

*Australian Bureau of Statistics*

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