

全身震動對脊髓損傷患者 下肢肌肉張力與硬度之影響



Effect of Whole Body Vibration on Muscle Tone and Hardness of Lower Extremity in the Patients with Spinal Cord Injury

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簡述內容：

通常脊髓受傷的患者，受傷的部位以下會造成癱瘓，代表著運動、感覺及大小便功能失常，而脊神經的傷害會導致肌肉的神經性萎縮，包含肌肉緊張、僵化、痙攣及非控制性的自主運動，而實驗採用全身垂直律動可以促使血液循環變好，增加脊椎處神經連結，提升肌肉的彈性，明顯改善脊髓損傷患者的下肢肌肉硬度，因此全身垂直律動的運用對無法自主運動者來說，確實帶來有效安全復健運動方式，而另外此篇關於肌肉張力的部分，可能需更多的研究來佐證。

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Background and Purpose: Patients with spinal cord injury (SCI) usually have the problem of spasticity, which may change the viscoelastic property of muscles to become much harder. Recently, whole body vibration is reported to have the effect of muscle relaxation in healthy groups. Therefore, the purpose of this study was to investigate whether whole body vibration can reduce the muscle tone and hardness in the SCI patients. **Methods:** Ten complete or incomplete SCI patients (age: 48 ± 12 yrs) from National Taiwan University Hospital with increased muscle tone ($MAS \geq 1$) were recruited and divided randomly into 2 groups: very low frequency (5Hz) group I and low frequency (9.9Hz) group II. The vibrator (Bodygreen AV-001) provided 10 minutes vertical sinusoidal vibration and the amplitude of 3.6 mm during the intervention was kept the same in both groups. Before and after the vibration, electrical stimulation instrument (CADWELL Sierra II) was used to measure H-reflex of sural nerve to represent muscle tone and myotonometer (Neurogenic Technologies, Inc.) was to quantify the muscle hardness of right medial and lateral gastrocnemius (MG and LG, respectively). All the data were analyzed by SPSS with Wilcoxon Signed Ranks Test. **Results:** After the whole body vibration, muscle hardness of LG decreased ($p < 0.05$) in both groups and MG decreased ($p < 0.05$) only in the group II. However, there was no significant difference of H-reflex in both groups. **Conclusions:** Whole body vibration can decrease the muscle hardness of lower extremity in the patients of SCI immediately, but not the muscle tone. The results may imply that this intervention mainly increase the flexibility of muscle through peripheral, like thermal effect, not the central mechanism. **Clinical Relevance:** Findings suggest that whole body vibration at very low and low frequency with medium amplitude may increase muscle flexibility to prevent secondary complication in SCI patients.