

## PEER-REVIEW REPORT

**Name of journal:** World Journal of Clinical Cases

**Manuscript NO:** 48556

**Title:** Immediate muscle strengthening by an end-effector type gait robot with reduced real-time use of leg muscles: A case series and review of literature

**Reviewer's code:** 01213075

**Reviewer's country:** Taiwan

**Science editor:** Jin-Lei Wang

**Reviewer accepted review:** 2019-06-18 19:40

**Reviewer performed review:** 2019-06-26 12:27

**Review time:** 7 Days and 16 Hours

SCIENTIFIC QUALITY	LANGUAGE QUALITY	CONCLUSION	PEER-REVIEWER STATEMENTS
<input type="checkbox"/> Grade A: Excellent	<input type="checkbox"/> Grade A: Priority publishing	<input type="checkbox"/> Accept	Peer-Review:
<input type="checkbox"/> Grade B: Very good	<input checked="" type="checkbox"/> Grade B: Minor language	(High priority)	<input checked="" type="checkbox"/> Anonymous
<input checked="" type="checkbox"/> Grade C: Good	polishing	<input type="checkbox"/> Accept	<input type="checkbox"/> Onymous
<input type="checkbox"/> Grade D: Fair	<input type="checkbox"/> Grade C: A great deal of	(General priority)	Peer-reviewer's expertise on the
<input type="checkbox"/> Grade E: Do not	language polishing	<input type="checkbox"/> Minor revision	topic of the manuscript:
publish	<input type="checkbox"/> Grade D: Rejection	<input checked="" type="checkbox"/> Major revision	<input type="checkbox"/> Advanced
		<input type="checkbox"/> Rejection	<input checked="" type="checkbox"/> General
			<input type="checkbox"/> No expertise
			Conflicts-of-Interest:
			<input type="checkbox"/> Yes
			<input checked="" type="checkbox"/> No

## SPECIFIC COMMENTS TO AUTHORS

First, what are the original findings of this manuscript? What are the new hypotheses that this study proposed? What are the new phenomena that were found through experiments in this study? What are the hypotheses that were confirmed through



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experiments in this study? Second, what are the quality and importance of this manuscript? What are the new findings of this study? What are the new concepts that this study proposes? What are the new methods that this study proposed? Do the conclusions appropriately summarize the data that this study provided? What are the unique insights that this study presented? What are the key problems in this field that this study has solved? Third, what are the limitations of the study and its findings? What are the future directions of the topic described in this manuscript? What are the questions/issues that remain to be solved? What are the questions that this study prompts for the authors to do next? How might this publication impact basic science and/or clinical practice? First: summary of study. This manuscript reported a study on 12 patients who underwent two interventions (5-minute training on a floor at a comfortable pace or training in an EEGR with non-weight bearing on their feet and 100% guidance force at 2.1km/hour). The authors assessed isometric peak torque (PT), maximal ratio of torque development (MRTD), amplitude of compound motor action potential (CMAP), and area under the curve (AUC) were evaluated before and 10 minutes after both interventions. The results showed that the degree of PT improvement of the dominant knee flexors was larger in the EEGR than on the floor ( $9.6 \pm 22.4$  Nm/BW,  $p < 0.01$ ). The EEGR-trained patients had greater PT improvement of the dominant knee extensors than those who trained on the floor ( $4.5 \pm 28.1$  Nm/BW,  $p < 0.01$ ). All electromyographic activities of the thigh and shank muscles (peak CMAP, mean and peak AUC) were significantly lower for the use of the EEGR than walking on the floor. The author concluded that immediate strengthening of the knee flexors and extensors was induced after the 5-minute EEGR training, despite reduced muscular use. The effect was maintained for 10 minutes and accompanied by the simultaneous reduction of the usage of the thigh and calf muscles. It may be a useful tool to strengthen the leg muscles in the elderly or in patients with musculoskeletal injuries. Second:

Comments: This manuscript reported an interesting study on the application of EEGR to improve the strength of knee flexors and extensors immediately after 5 min training program. It may be a potential application for the elderly patients in the future to prevent frailty. However, this study needs more evidence to achieve such a conclusion. More issues are needed to be addressed before considering for publication in World Journal of Clinical Cases. 1. The recruited subjects were young to middle ages with relatively healthy status. Regarding the study about the muscle strength, the data of body composition is important for basic information, especially for such development of new device. In addition, some elderly patients should be recruited for study because they will be the target for potential application. 2. The study is a cross-sectional, non-randomized study. In addition, this is an one author article. It means impossible to conduct a single-blinded study. Therefore more studies are needed to be done and proved the effects. The author needed to explain the criteria of appropriate controls in this study. Some parameters may need be revised for optimal or better outcomes. This preliminary data may be more valuable and supported by a well-designed study. 3. Regarding the mechanisms, the author has been conducting an electrophysiology-, biomechanics-, computer tomography-based randomized, controlled trial using the end-effector type gait robot to prove the rapid brain and spinal plasticity as it's underlying mechanism. This may also need time and research designs. 4. Muscle strength is closely related to the muscle balance. The clinical significance of increased muscle strength of knee flexor and extensor should be discussed, especially no effects of study on other muscle groups. The authors also should provide an effective way to control a proper muscle balance.

#### **INITIAL REVIEW OF THE MANUSCRIPT**

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