Effects of home-based intelligent grip strength system on the improvement of hand grip strength and hypertension in older adults

Bennu Yiu, Emma Mak
Continental Supplies Ltd

Yang Ju, Yinying Zhang
Nursing Department, The First Affiliated Hospital of Suzhou University

With the use of Oriori grip training ball - motion series, an intelligent grip strength system, we established this study to evaluate the effects of muscle training on the improvement of hand grip strength and hypertension. The grip strength system is smart and ergonomically designed grip ball that consists of a six-axis somatosensory chip (minimum recognitions of 1 degree angel and of 0.4 ms^{-2} space acceleration), a grip strength sensor (minimum recognition of 10 g pressure perception progress) and Bluetooth, coupled with iOS or Android app that consists of built-in upper limb training programmes including handgrip at various resistance levels. Hand grip training has been shown to reduce hypertension (de Sousa Almeida, *et al*., 2021; Ji *et al*., 2018). Some co-authors of this research abstract recently have shown in a clinical study that intelligent grip system, when compared to traditional grip strength ball, can significantly improve the upper limb venous blood circulation, and reduce the incidence of catheter-related thrombosis in patients with peripherally inserted central catheter line (PICC)(JU, *et al*., 2021).
In the light of these, the objectives of the study are first to examine the effects of an eight-week home-based grip training programme, with smart monitoring, on maximum handgrip strength and hypertension. Preliminary investigations have indicated that the Oriori grip training ball can be used with ease by normal people without hand injuries, and 20 hypertensive older adults, aged 50 to 65, in two randomized groups, will be recruited for this study in Hong Kong. Individuals with arterial hypertension (systolic arterial pressure > 140 mmHg or diastolic arterial pressure > 90 mmHg) and without hand injuries are included in this study. Handgrip training for eight weeks (three days per week) will be performed, and the subjects will be submitted for examination of maximum grip strength and resting and ambulatory blood pressure and by accelerated plethysmography on cardiovascular conditions. The results may have important implications on the use of home-based muscle and cardiovascular training for primary care, especially during the COVID-19 pandemic.

References:

Ji, *et al.*, 2018, *Lipids in Health and Disease,* 17, 86-92
JU, *et al*., 2021, *Chinese Journal of Nursing*, 56(8), 1169-1173

de Sousa Almeida, *et al*., 2021, *Hypertension Research*, 44, 1205–1212

Relevance to the Conference:

- Adoption of gerontechnology in hospital/ community settings

Adoption of gerontechnology for enhancing the quality of life of the older adults