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Error augmentation as a possible technique for improving upper extremity motor performance after a stroke: A pilot study

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Enhancement of motor performance is crucial in rehabilitation after a stroke. A new concept in motor learning and rehabilitation is error augmentation: Using erroneous sensory feedback to enhance adaptation to a new environment. However, the clinical efficacy of this method to enhance motor learning after a stroke needs to be evaluated.

To determine the efficiency of Error-Augmentation therapy over sham robotic training for the enhancement of the upper extremity motor performance after a stroke. Ten patients after a stroke randomly assigned into study or control groups. The study group (EA) executed error-augmentation training using DeXtreme robotic interface with the activation of a force field while the control group (Cont.) executed a robotic training using the same device without the activation of the force field. Both groups carried out 12 treatment sessions by the same protocol. The effect of treatment was measured by the robotic device by two objective outcomes: Mean trajectory error; Total performance score in hand reaching. The study group (2802 ± 473) and the control group (1160 ± 1155) displayed an increase in total performance score and reduction in mean error (6.2 ± 5.5 and 2.2 ± 4.5 respectively) in four weeks of error-augmentation treatment for the upper extremity. Error augmentation training implemented by robotic interface has been shown to potentially be an efficient platform to enhance upper extremity motor performance after a stroke.

Biography

Eli Carmeli is an Associate Professor in the Physical Therapy Department at Haifa University. He is the Chairperson of the Master Degree program in the university. He served for six years as the Chief Editor of the "Israeli Physiotherapy Journal". His main research and teachings areas are physical function at advanced age and biology of skeletal muscle.

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