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**“ARMEO POWER: KINEMATIC ANALYSIS OF THE UPPER LIMB PRE AND POST ROBOTIC TREATMENT IN HEMIPARETIC PATIENTS, PILOT STUDY”.**

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## **INTRODUCTION and AIM**

The rehabilitation of the upper limb after stroke by functional impairment is a major challenge for rehabilitation. As part of the new techniques of relearning, the use of robotic exoskeletons is proving effective.

## **PATIENTS/MATERIALS and METHODS**

The study aims to investigate the effects of training with a robot-assisted rehabilitation of the upper limb exoskeleton Armeo ® Power for the recovery of motor function of the upper limb in patients after stroke. Patients suffering from hemiparesis in the aftermath of recent stroke cerebri were subjected to training with a robotic exoskeleton duration of 4 weeks.

At inclusion the following rating scales were given: Frenchay Arm Test, the Nine- Hole Peg Test ( NHPT ) , the modified Ashworth scale ; were subjected to a battery of tests available on Armeo ® Power : reaction time, capture vertical , A- Goals , A- ROM , A- Force; were subjected to an evaluation of motion analysis for upper limb (protocol RAB) in order to study the kinematics of the movement of " pointing " . the parameters of fluidity of movement were considered IC (index of curvature) , NMU (number of peak speed), speed (max and average within the motor task ) , Delta T ( seconds it takes to reach the target ) , Normalized Jerk . the angular parameters of the shoulder and elbow were also taken into account.

## **RESULTS**

The rating scales Were again administered and the results were compared with those obtained at the time of recruitment. There have been significant improvements in the clinical scales of assessment. With regard to the present evaluative exercises on Armeo Power, the patients completed the exercises more quickly and with greater precision. There were no significant changes in active ROM. With regard to the task studied with the motion analysis, all the parameters are significantly improved after the training, a clear sign of better accuracy and fluidity of movement after training.

## **DISCUSSION and CONCLUSIONS**

These indices obtained with instrumental Armeo power and with the analysis of the movement could be used to integrate and support the clinical evaluation of the upper limb in patients suffering from outcomes in stroke because they provide information on the deficit and the impairment in the ability of the motor control and are a very accurate monitoring of motor recovery.

## **REFERENCES**

- [1] Menegoni et al: “Quantitative evaluation of functional limitation of upper limb movements in subjects affected by ataxia”
- [2] Frisoli et al.: “Positive effects of robotic exoskeleton training of upper limb reaching movements after stroke”. Journal of NeuroEngineering and Rehabilitation 2012 9:36.