



O018 / 279

COMPUTATIONAL ASSESSMENT OF HAND MOTOR SKILLS IN STROKE PATIENTS

D. López¹, L. Casado², Á. Gutiérrez³, B. Fuentes², R. Sendra-Arranz³, J. Rodríguez-Pardo², R. Rigua², G. Ruiz-Ares², E. de Celis², D. Hernández⁴, E. Abdel-Mutti⁴, E. Díez-Tejedor², M. Alonso de Leciñana²

¹Hospital La Paz Institute for Health Research (IdiPAZ), Neurology, Stroke Center, University Hospital La Paz, Madrid, Spain, ²Hospital La Paz Institute for Health Research (IdiPAZ), Universidad Autónoma de Madrid, Neurology, Stroke Center, University Hospital La Paz, Madrid, Spain, ³ETSI Telecomunicación, Universidad Politécnica de Madrid, Madrid, Spain, ⁴Hospital La Paz Institute for Health Research (IdiPAZ), Universidad Autónoma de Madrid, Rehabilitation, University Hospital La Paz, Madrid, Spain

Background and aims: Deficits affecting hand motor skills negatively impact in the functionality and quality of life of stroke patients. In practice, these deficits are assessed with clinical scales that are not sufficiently accurate. It is therefore necessary to develop tools that allow to set an objective assessment to better establish the degree of disability.

Methods: A software application was developed to obtain kinematic data from hand movement tracking by a portable device with two cameras and three infrared sensors (leap motion ®). Four exercises were chosen for analysis:

- (1) wrist flexion-extension
- (2) finger-grip opening-closing
- (3) finger spread
- (4) fist opening-closing.

A validation study comparing data from patients with mild to moderate hand motor deficit was done. Correlations with the FMA-UE (hand items) score were analysed.

Results: Eighty stroke patients and ninety-three controls were recruited. The software allowed identification of significant differences in motor performance between patients' symptomatic hand and controls and also between patients' theoretically unaffected side and controls ($p < 0,05$). Even patients with the maximum score on the FMA-UE scale showed significant differences with controls in certain exercises. Moreover, correlations between kinematic data and FMA-UE score were poor (Pearson's correlation coefficient: 0,15 to 0,35), which suggests that the application enables measurement of deficits that are not detected by the clinical scales.

Conclusions: A new software for kinematic analysis using optical technology provides a useful tool to objectify hand deficits after a stroke. It may aid in the accurate assessment of disability and in optimization of rehabilitation therapies.

Disclosure: No