Pilot study for use of a virtual model for analyse paretic upper limb funcional outcome evolution in acute stroke patients

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Introduction: Approximately 70-80% of stroke patients have upper limb (UL) impairments in acute phase and 40% in chronic phase. UL functional prognostic depends mostly of the motor control beginning and muscle balance above shoulder and hand (fingir extension) evaluated first days after stroke. These prognostic factors are evaluated by clinical test.

Purpose: Establish a model that predicts the functional outcome of the hand based on clinical and kinematic variables of the hand.

Material and methods: Longitudinal, prospective study. Inclusion criteria: patients with paretic UL secondary to acute stroke, without previous stroke or motor sequelae. Evaluated: 3-4 day, 7 day, 3 and 6 month after stroke. Collected variables: demographic, stroke type, Oxford Classification and NIHSS Scale; Barthel Index (BI), Rankin Scale, UL Fugl-Meyer Scale (FM), Ashworth, UL Muscle Balance with Medical Research Council Scale (MCR). Action Research Arm Test (ARAT) evaluated at 6 month. Hand kinematic has been evaluated by Cyberglove glove *Results:* 32 evaluated patients, 5 excluded for lack of monitoring, 6 exitus and 3 new stroke. Total 18 patients with 67,7 medium age (DE10.9); 6 women and 13 men. No significant relation with ARAT at 6 months: sex, age. Significant relations ($p<0.05$) with ARAT at 6 month: NIHSS, Ashworh, FM, MCR. Tendency towards statistical significance: stroke type, BI, Rankin scale, but not enough because short sample. Hand simulation has given a virtual support to check UL evolution.

Conclusion: The study of motion simulation of the paretic hand paretic in patients with paretic UL after acute stroke, could guide us to predict functional outcome of the upper limb.