

Posture analysis in motion laboratory. The impact in rehabilitation stroke patients: Report Case

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OBJECTIVE

The goal of our study was to assess whether the postural control are altered among individuals who have suffered a stroke.

METHODS

Patient

An 53-year-old woman presented a subtle left hemiparesis post-stroke.

Material

The study occurred in the Motion Analysis Laboratory and the data was taken using Hawk Digital System. The laboratory system is composed by three strength platforms, sensible to mechanic deformation. The system is connected to a hardware that allows the verification of COP variables.

Case Description

The protocol was to apply virtual reality game of Nintendo Wii Fit Plus and conventional therapy, during 48 sessions, 2 days a week, simultaneity. The admission assessment was made and divided into functional, using the Berg Balance Scale (BBS) and the Rivermead test; and biomechanical evaluation.

For the voluntary analysis the patient stayed in the upright position for 60 seconds keeping the feet over the force platform¹ (Figure 1a, 2a, 3a). The variables chosen for analysis were the COP and COG², which were calculated by the analysis system biomechanics lab of motion as described above, and the data was processed using the software Matlab 7.0 (Mathworks, Inc.).

RESULTS

After rehabilitation there was improvement of functional paramentros (BBS and Rivermead Test). In addition, after the rehabilitation interventions the patient was re-analyzed in the laboratory and the parameter demonstrated below. (Figure 1b, 2b, 3b). Measurements of postural sway in stroke patients consistently demonstrate a shift of the centre of pressure towards the non hemiplegic side. The shift in the centre of pressure is related to asymmetrical weight bearing through the lower limbs. There was also an approximation of the COP Vs COG, indicative of improvement in postural control (Figure 2a and 2b).

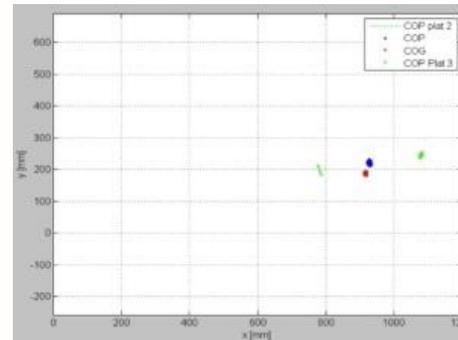


Figure 2a: before rehabilitation.

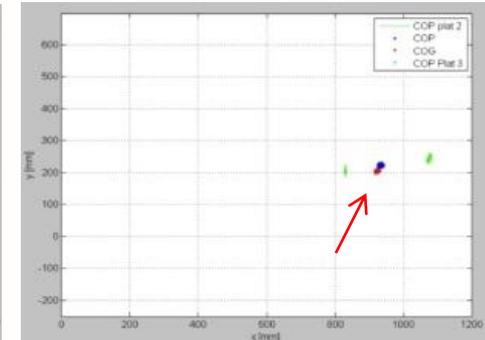


Figure 2b: after rehabilitation. Red arrow indicates approach of COP and COG.

COP plat 2: Center of pressure right lower limb, CPO: Center of pressure, COG: Center of gravity, CPO plat 3: Pressure center left lower limb.

DISCUSSIONS/CONCLUSION

This lateral shift is observed during quiet standing, as well as during weight shifting activities. The shift in the centre of pressure is related to asymmetrical weight bearing through the lower limbs, as demonstrated in other studies³. The findings of our case are relevant for the implementation of quantitative measures in rehabilitation protocols for this population.

REFERENCES

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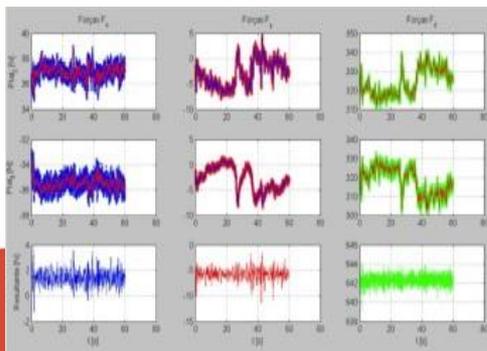


Figure 1a, 2a, 3a: Data from platforms 2 and 3 Fx, Fy, Fz. Before rehabilitation .

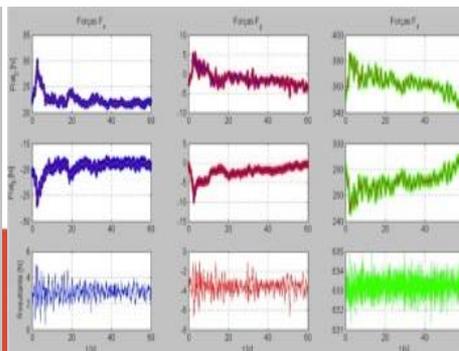


Figure 1b, 2b, 3b: Data from platforms 2 and 3 Fx, Fy, Fz. After rehabilitation.