Abstract Preview - Step 3/4

- print version -

Primary topic: Robotics & technology

2nd topic: Orthopaedics

Title: **THE EFFECTS OF INSOLE-BASED VISUAL BIOFEEDBACK ON WEIGHT-BEARING IN PATIENTS UNDERGOING TOTAL HIP REPLACEMENT**

Author(s): Marin L[1,2,3], Arcuri G[3], Febbi M[2], Chiodaroli M[3], Pedrotti L[4,5], Manzoni F[6]

Institute(s): *[1]University of Pavia, Laboratory of Adapted Motor Activity (LAMA), Department of Public Health, Experimental and Forensic Medicine, Pavia, Italy, [2]University of Tor Vergata, Technologies for Sports Medicine and Rehabilitation, Department of Industrial Engineering, Rome, Italy, [3]Città di Pavia Hospital, Department of Orthopedics Rehabilitation, Pavia, Italy, [4]University of Pavia, Department of Pediatric Diagnostic Surgical Clinical Sciences, section of Pathologies of the Musculoskeletal System, Orthopedics unit, Pavia, Italy, [5]Città di Pavia Hospital, Department of Orthopedics Surgery, Pavia, Italy, [6]University of Pavia, Department of Public Health, Experimental and Forensic Medicine, Unit of Biostatistics and Clinical Epidemiology, Pavia, Italy*

Text: **Background:** Total hip replacement surgery (THR) is a common procedure used to treat arthtritis that don´t respond to others types of therapies. After surgery, compensations persist during gait, as also shown by 6 and 12 months follow-ups. Correct static and dynamic weight-bearing (WB) on two legs is one of the main focuses of rehabilitation. Patients training is principally made through verbal instructions. Many studies have shown the effectiveness of biofeedback on correct WB on two legs in the early phase of THR rehabilitation.
The aim of the study is to investigate the effects of visual biofeedback on WB rehabilitation in patients undergoing first total hip replacement.
The visual biofeedback is based on a sensorized system for the dynamic evaluation of the plantar pressure (Flexinfit, Sensormedica, Guidonia Montecelio, Rome, Italy). The difference among this system and the other ones is a lower thickness (0.3 mm) of the insoles that can be worn in patient shoes. It lets patient not to modify posture and gait cycle.
Purpose: To compare the difference in weight-bearing percentage distribution (ΔWBP) on two legs of two different groups of patients undergoing first THR surgery. Secondary objective of the study is to evaluate plantar pressures during ambulation, gait autonomy, quality of life and perceived pain.
Methods: A randomized controlled trial was conducted. Thirty-four patients, undergoing first THR surgery with the same intervention technique, were enrolled and divided into two groups. Experimental group (EG) followed the training wearing sensorized insoles that provided plantar pressures and shift of foot center of pressure images on three monitors. Control Group (CG) followed verbal instructions of physiotherapist during training. No statistically significant differences were found between the two groups for the demographic and anthropometric data analysed except for BMI, which was statistically lower in the study group than in control group (mean 26.5 kg/m2 vs 26.9 kg/m2; p = 0.032). Patients were assigned to EG or CG on second postoperative day. From 4th to 10th postoperative day (T_0-T_1) both groups did the same rehabilitation program including exercises to restore correct WB. Evaluations were made on T_0 and T_1.
Results: The analysis performed on the enrolled sample could suggest an association between treatment and in time reduction with the study group reporting higher ΔWBP reduction (p=0.049).
Another association could be observed between treatment and in time reduction in the difference between WB on healthy limb (WBHL) reported for the two legs (p=0.012), with the EG reporting higher ΔWBHL reduction. Distance reported at the six minutes walking test was higher on the EG than the CG even if not statistically significant. We disclosed a relevant difference between two legs step duration in EG, even if not statistically significant.
Conclusion(s): Results seem to point out the effectiveness of visual biofeedback based on sensorized system with dynamic evaluation of the plantar pressure on WB of patients undergoing THR.
Implications: It could represent a useful support to restore correct WB in patients undergoing THR.
Key-Words: Total Hip Replacement ,Weight bearing ,Visual biofeedback
Funding acknowledgements: No funding was received to conduct this study.

Ethics approval: Yes

Institution: IRCCS San Matteo Hospital Foundation

Ethics Committee: Ethics Committee Pavia Area

Ethics number: Prot. 20180036031, 20th April 2018

Ref. Number A-0990-0000-01924

Conference: WCPT Congress 2019 10-13 May 2019 · Abstract: A-0990-0000-01924 · **Status: Draft**

Print ← Back