

Does rehabilitation changes in gait kinematic parameters in total knee arthroplasty subjects? A prospective observational pilot study

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Background: Total knee arthroplasty (TKA), is a routine surgical intervention. After surgery is common practice for every subject to undergo a period of rehabilitation to recover strength, range of motion and walking ability of the affected limb. Many evaluation scales have been developed to evaluate improvements during and after rehabilitation, but the walking ability has rarely been evaluated in the acute phase (3-30 days post-surgery). Aim of the study is to evaluate the effect of rehabilitation on functional outcomes scales and gait quality, through an optoelectronic system.

Methods: After receiving Ethical approval (4-16/12/2015), in a postacute rehabilitation hospital, subjects were recruited after receiving TKA; inclusion criteria were stable clinical conditions, and no neurological or rheumatic pathologies or previous surgeries at the lower limbs. International knee society score (IKSS), Barthel Index (BI), Numerical Rating Scale (NRS), Knee Flexion (KF), and gait analysis (GA) were assessed at hospitalization (T0) and discharge (T1). The GA system is a BTS DX-400, at least 3 walks were performed. Gait was allowed with one or two crutches according to needs. The rehabilitation program was based on restoring ROM and strength of the lower limb.

Results: 20 subjects (67±12 years, 11 females, 11 left knees) met the inclusion criteria. Subjects showed a significant difference between T0 and T1 in all the functional evaluation scales ($P<0.001$) excluding NRS ($P>0.05$). None of the GA parameters showed a significant improvement ($P>0.05$). Neither the spatio-temporal parameters showed significant improvements ($P>0.05$).

Discussion: This study highlights how rehabilitation improves knee function, but for what concerns gait quality, no improvements have been retrieved in the gait of patients. Rehabilitation focused on the functional competence of the subjects, gait in this perspective was completely neglected, changing the contents of the rehabilitation program could modify the results of this study. This study has a small sample size even if the results are quite significant, the study is still ongoing to include more subjects.

Conclusion: A conventional rehabilitation program is able to restore the knee function, but did not modify gait parameters, a specific focus on gait training should be included in the rehabilitation program of TKA.