EFFECTIVENESS OF TECHNOLOGY ASSISTED EXERCISE COMPARED TO USUAL CARE IN TOTAL HIP ARTHROPLASTY

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Purpose:

Technology assisted exercise are increasingly used in exercise rehabilitation often without appropriate clinical evaluation. The aim of this study is to assess the effectiveness of a 6 weeks technology assisted exercise intervention (ICURA) compared to supervised group exercise twice weekly in 6 weeks in patients after total hip arthroplasty (THA).

Method and materials:

Participants after THA admitted to post-surgery rehabilitation in 4 municipalities in Copenhagen were randomized to either ICURA or supervised group exercise for 6 weeks. The randomization used permuted blocks on 4, 6 and 8 and was stratified on municipality. The ICURA group received one supervised group session every week and was instructed to perform exercise at home using a predefined exercise program in a smartphone app. Exercise performance was monitored via sensor technology. Physical therapists monitor exercise progression on a website and adjust with the patient on the weekly session. The supervised exercise group received supervised exercise on a rehabilitation center twice weekly. Primary outcome were 10 meters walk, secondary outcomes were 30 seconds sit-to-stand, 2.45 meters "Up and Go" test and Hip disability and Osteoarthritis Outcome Score (HOOS). Difference in outcomes after 6 weeks was adjusted for baseline-score and municipality. Analysis was firstly performed as completer analysis and secondly as intention-to-treat using the baseline score carried forward (BACF). Finally the differences between the two interventions were compared to the predefined equality point, which was set at 20%.

Results:

171 THA patients were included (84 to ICURA and 87 to usual care) and 148 (71 and 77 respectively) completed the intervention. The completer analysis showed only small and not clinical relevant differences in the effect between the two interventions in 10 meters walk (-0.20 seconds 95%CI -0.66 to 0.26; P=0.39), 30 seconds sit-to-stand (-0.99 times 95%CI -2.11 to 0.13; P=0.08) and 2.45 meters "Up and Go" (-0.44 95%CI -0.86 to -0.01; P=0.04), where negative is in favour of the supervised exercise group.

Furthermore there were no differences in the five domains of the HOOS; pain (0.98 95%CI -2.95 to 4.90; P=0.63) other symptoms (-1.56 95%CI -5.78 to 2.67; P=0.47), function in daily living (1.15 95%CI -2.81 to 5.11; P=0.47), function in sport and recreation (2.81 95%CI -3.19 to 8.81; P=0.36) and hip related Quality of life (0.23 95%CI -5.71 to 6.18; P=0.94). Similar results were seen in the intention-to-treat analysis for all the

tested outcomes. The differences in effect between the two interventions were for all outcomes less than 10% as seen in figure 1.

Conclusion:

Similar effects of 6 weeks rehabilitation were seen in patients with THA receiving either ICURA or supervised group exercise. The technology assisted exercise intervention (ICURA) is equally effective alternative to supervised group exercise performed in a rehabilitation centres for patients with THA.
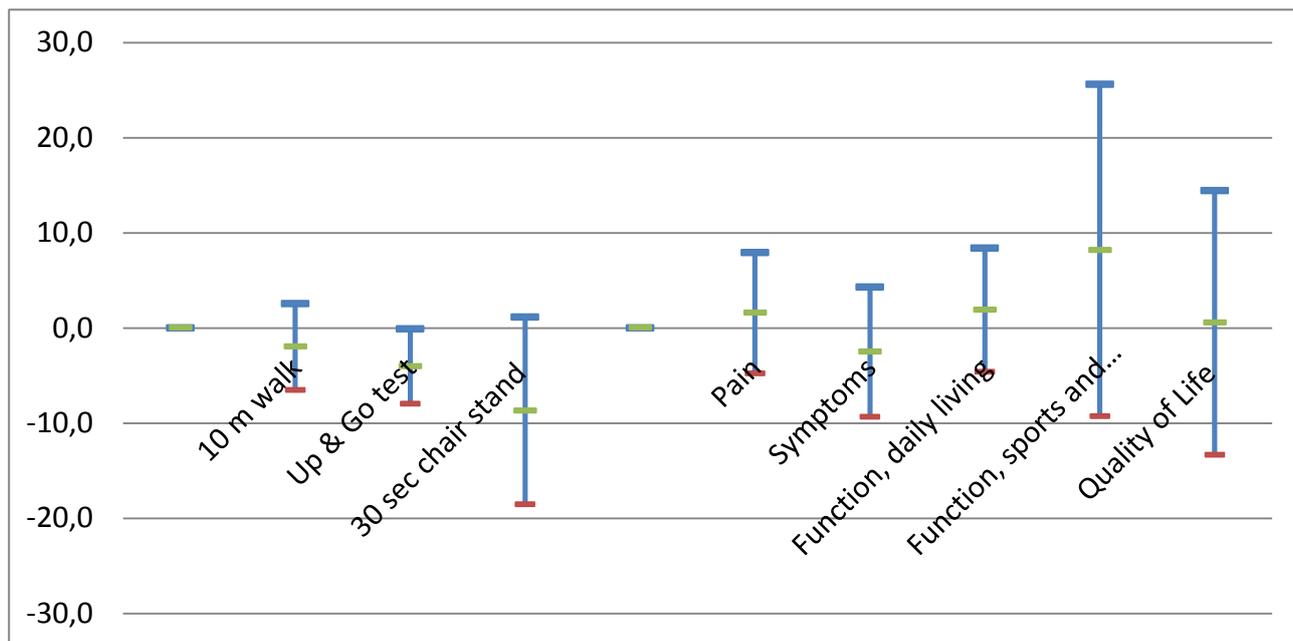

Figure 1. Differences in percentage change after 6 weeks exercise between the technology assisted exercise intervention (ICURA) and the supervised exercise group in patients after total hip arthroplasty. Estimates below the zero-line are in favour of the supervised exercise group and estimates above favour the technology assisted exercise intervention.