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Appraisal

Critically Appraised Papers

A neuromuscular exercise program prior to hip or knee arthroplasty does not improve recovery of function three months after surgery

Synopsis

Summary of: Villadsen A, et al. Postoperative effects of neuromuscular exercise prior to hip or knee arthroplasty: a randomized controlled trial. *Ann Rheum Dis*. 2013 May 9. [Epub, ahead of print.] [Prepared by Kåre B Hagen and Margreth Grotle, CAP Editors]

Question: Does neuromuscular exercise prior to total joint arthroplasty of the hip or knee produce any additional postoperative benefits compared with joint arthroplasty alone? ***Design:*** A randomised, controlled trial with concealed allocation. ***Setting:*** Odense University Hospital, Denmark. ***Participants:*** Adults scheduled for primary unilateral total hip or knee arthroplasty due to severe osteoarthritis (OA). Randomisation allocated 84 participants to exercise and 81 to control. ***Interventions:*** Both groups received preoperative education comprising written handouts and a 3-hour information session, while the intervention group also underwent 8 weeks of supervised neuromuscular exercise. The program was delivered in a group setting for 1 hour twice a week and consisted of a 10-minute aerobic warm-up on an exercise bike followed by a circuit program with core stability/postural control, postural orientation, lower extremity muscle strength and functional exercises. A physiotherapist monitored the quality of movement and progressed training level when indicated. ***Outcome measures:*** The primary outcomes were the Activities of Daily Living (ADL) subscale of the Hip disability and OA Outcome Score (HOOS) and the Knee injury and OA Outcome Score (KOOS) for patients with hip and knee OA, measured 3 months after surgery. Secondary outcomes were the other HOOS/KOOS subscales and the EuroQol 5D Questionnaire. ***Results:*** In total, 153 patients completed the 3-month postoperative assessment. There was no difference between the groups in ADL (mean difference 4.4 points, 95% CI −0.8 to 4.5), or any of the secondary endpoints at 3 months. Six weeks after surgery, the intervention group demonstrated statistically significant greater improvement in ADL and pain than the control group. ***Conclusion:*** Three months after surgery, there was no additional effect of an 8-week preoperative exercise program.

Commentary

Systematic reviews disagree about the effects of preoperative exercise for patients with hip or knee arthroplasty. Three recent papers concluded that there is no beneficial effect,[1,2,3] while others concluded that there may be beneficial effects, like improvement of short-term functional outcomes,[4] faster recovery,[5] or reduced hospital stay.[6]

This trial examines whether a preoperative neuromuscular exercise program had an additional effect on patients receiving total joint replacements (TJR) of the hip or knee. The results showed no difference in the effects of the 8-week preoperative program 3 months after surgery. However, the authors underline that the exercise group experienced a significant short-term (6 week) benefit in ADL and pain. This short-term result can be considered as an earlier onset of the postoperative recovery, which is a valuable result. Further, as TJR generally results in considerable improvements in pain and physical function,[7] a substantial additional effect of a preoperative program can hardly be expected.

The 9 to 20% of patients that undergo knee replacement with a poor outcome[8] could benefit from a preoperative exercise program. In the current study, the inclusion criteria may have excluded some possible responders, as patients with previous fractures, inflammatory arthritis or other co-morbidities were not eligible. Furthermore, the participants were significantly younger than those who declined participation; the generalisability of the results is therefore somewhat limited. The current study had sufficient power, very good exercise adherence and robust analyses. The varying results of studies examining preoperative exercise programs may be due to the heterogeneity in people undergoing TJR. Thus, to gain more insight into the effects of preoperative exercise, further research should target subgroups most likely to benefit from such interventions.

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