The Effect of Preoperative Physical Activity on Knee and Hip Arthroplasty Outcome in Patients with Osteoarthritis

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Background: Joint replacement is a therapeutic option increasingly widely spread among osteoarthritis (OA) patients. Besides improving operating techniques and postoperative management, it is important to pursue the best preoperative conditions in order to achieve the desired result. As physical activity potentially acts on the preoperative predictors, knowing the effect of leisure and occupational PA should be of great interest to obtain a positive outcome.

Objectives: To investigate the influence of preoperative PA on the clinical outcomes of total hip arthroplasty (THA) and total knee arthroplasty (TKA) in OA patients.

Methods: Data from the Knee and Hip OsteoArthritis Long-term Assessment (KHOALA) cohort (1), a multi-regional French cohort of 878 patients with symptomatic hip and/or knee OA, were analysed. We included in our study patients undergoing THA or TKA during a 7-year-follow-up period. The level of total and leisure-time preoperative PA was measured with the Modified Activity Questionnaire (MAQ). Outcomes were measured one year after surgery. For the primary endpoint, quality of life (QoL) was measured with the OsteoArthritis Knee and Hip Quality Of Life questionnaire (OAKHQOL). For secondary endpoints, QoL was measured with Short Form 36 (SF-36), pain with the Visual Analogue Scale (VAS), function with the Western Ontario McMaster Universities OsteoArthritis Index (WOMAC) and walking distance. The population characteristics were described using frequency or mean and standard deviation (SD), depending on the distribution of the variable. Association between exposures and outcomes was calculated with a multivariate linear analysis with backward selection, adjusting for confounders (age, sex, body mass index, site of joint replacement, polyarticular OA, OA duration, comorbidities, radiological grade of OA, inclusion centre, rehabilitation after surgery, previous joint issues, instruction level). A P-value <0.05 was set as statistically significant.

Results: 150 patients were included. 58.7% underwent TKA and 41.3% THA. The mean age at the time of surgery was 66.6 years (±7.7 SD). The majority of patients were female (75%), overweight (mean BMI 29.63 kg/m², ±5.5 SD) and had polyarticular OA (60%). 53% of patients met the World Health Organization recommendations on PA before surgery. For the primary endpoint, a high preoperative total PA was associated with a better relationship with the partner (β = 0.55, p = 0.02) one year after surgery. As for secondary endpoints, a high two-year preoperative total PA was associated with an impaired SF-36 Mental Component Summary score (β = -0.87, p = 0.02), but a longer walking distance (β = 442.81, p < 0.01). Leisure-time PA also showed a positive impact on walking distance (β = 76.25, p = 0.02), but a negative one on social functioning in SF-36 (β = -0.47, p = 0.01). No statistically significant association between preoperative PA and WOMAC was found.

Conclusion: In this cohort study, the preoperative level of PA demonstrated a heterogeneous effect on the various aspects of QoL one year after THA and TKA in OA patients. Preoperative PA was directly associated with gain of function, measured as walking distance, after surgery. Considering the increasing prevalence of OA and the crucial role of PA on health, further studies on this relevant topic are needed.