Safe Activity participation Following Elective Total hip replacement – SafeT

Ajay Shah[1], Cari Whyne[1], Alex Kiss[1], Harman Chaudhry[1]
[1]University of Toronto, Toronto, Canada
Cari.Whyne@Sunnybrook.ca

Disclosures: Ajay Shah (N), Cari Whyne (N), Alex Kiss (N), Harman Chaudhry (N)

INTRODUCTION: Total hip replacement (THR) is one of the most common elective surgeries performed, with increasing demand among younger patients as survivorship improves. Few evidence-based guidelines exist to guide recommendations on safe activity participation following THR. The purpose of this prospective study was to identify whether intensity of physical activity following THR was associated with pain, functional outcome scores, or early revision surgery within 10 years of the index procedure.

METHODS: This study was approved by the institutional review board, and all patients provided informed consent. A novel parallel-design prospective cohort study consisted of two groups undergoing THR: one recruited pre-operatively (Cohort 1), and another at 5-7 years post-op (Cohort 2). Each group was followed for five years. Demographic variables including age, gender and BMI were included, surgical data were collected, and activity data including duration and intensity of activities (categorized A to F, with increasing intensity and complexity of motion), PROMs, and pain scores were recorded at each visit. The primary outcome was a change in hip pain with increasing activity intensity; secondary outcomes included decreased activity duration, increased revisions, or a change in PROMs with respect to specific activities.

RESULTS SECTION: 1098 patients were included in this study (Cohort 1: 588 patients, Cohort 2: 510 patients). A regression analysis showed no significant interaction between activity intensity, hip pain, and temporal variables. 15.6% of participants participated in the highest intensity activities (Category E and F). Participants undertaking high-intensity activity showed no significant decrease in activity duration over time, no change in PROMs, and no increased revision rates compared to other groups. Analysis of individual activities revealed that certain activities (snowboarding, squash, tennis, and backpacking) were more strongly correlated with hip pain, while others (snorkeling, swimming, home weights, aquafit, cross-country skiing, sledding) were strongly negatively correlated with hip pain. Based on this regression, activities were reclassified by their risk of being associated with hip pain (Figure 1). Data were represented visually using an online Tableau.

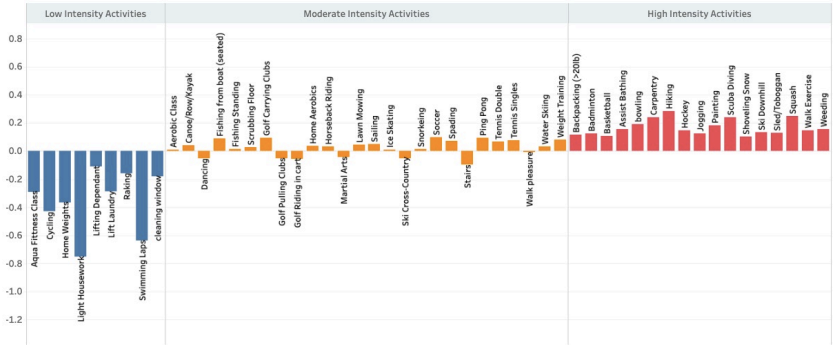
DISCUSSION: In conclusion, this study showed that most activities are safe for participation following THR. Participation in higher intensity activities was not associated with worse hip pain or outcomes.

SIGNIFICANCE/CLINICAL RELEVANCE: Surgeons can counsel patients that certain activities (snowboarding, squash, tennis, and backpacking) may be associated with hip pain, but not an increased 10-year revision rate.

REFERENCES:

- Learmonth ID, Young Claire, Rorabeck C. The operation of the century: total hip replacement. Lancet. 2007 Oct 27;370(9597):1508-19.
- Charnley J. Arthroplasty of the hip. A new operation. Lancet. 1961 May 27;1(7187):1129-32.
- Evans JT, Evans JP, Walker RW, Blom AW, Whitehouse MR, Sayers A. How long does a hip replacement last? A systematic review and meta-analysis of case series and national registry reports with more than 15 years of follow-up. Lancet. 2019 Feb 16;393(10172):647-654.
- Shichman I, Roof M, Askew N, Nherera L, Rozell JC, Seyler TM, Schwarzkopf R. Projections and Epidemiology of Primary Hip and Knee Arthroplasty in Medicare Patients to 2040-2060. JB JS Open Access. 2023 Feb 28;8(1):e22.00112.
- Beswick AD, Wylde V, Gooberman-Hill R, Blom A, Dieppe P. What proportion of patients report long-term pain after total hip or knee replacement for osteoarthritis? A systematic review of prospective studies in unselected patients. BMJ Open. 2012 Feb 22;2(1):e000435.
- Erivan R, Villatte G, Ollivier M, Paprosky WG. Painful hip arthroplasty: what should we find? Diagnostic Approach and Results. J Arthroplasty. 2019 Aug;34(8):1802-1807.
- Fortier L, Rockov Z, Chen AF, Rajaee SS. Activity Recommendations After Total Hip and Total Knee Arthroplasty. J Bone Joint Surg Am. 2021;103(5):446-455.

IMAGES AND TABLES:



Activity Reclassification based on Correlation with Hip Pain

Low Intensity Activity	Aqua Fitness Class, Assist Bathing, Canoe/Row/Kayak, cleaning window, Cycling, Fishing from boat (seated), Fishing Standing, Home Weights, Lifting Dependant, Light Housework, Painting, Sailing, Ski Cross-Country, Sled/Toboggan, Snorkeing, Swimming Laps, Volleyball, Water Skiing
Moderate Intensity Activity	Aerobic Class, Badminton, Dancing, Golf Carrying Clubs, Golf Pulling Clubs, Golf Riding in cart, Hockey, Horseback Riding, Ice Skating, Lawn Mowing, Lift Laundry, Martial Arts, Ping Pong, Raking, Shoveling Snow, Ski Downhill, Soccer, Weight Training
High Intensity Activity	Backpacking (>20lb), Basketball, bowling, Carpentry, Hiking, Home Aerobics, Jogging, Scrubbing Floor, Scuba Diving, Snowboard, Spading, Squash, Stairs, Tennis Double, Tennis Singles, Walk Exercise, Walk pleasure, Weeding