OARSI 2024

View Abstract

CONTROL ID: 4036900

TITLE: ASSOCIATION BETWEEN FREQUENT KNEE PAIN AND PAIN SEVERITY WITH QUADRICEPS STRENGTH OVER 5-YEARS: MULTICENTER OSTEOARTHRITIS STUDY

PRESENTATION TYPE: Either Podium or Poster

CURRENT CATEGORY: Clinical Aspects & Outcomes

AUTHORS (FIRST NAME, LAST NAME): David A. Sherman[1], Brooke McGinley[1], Tuhina Neogi[1], David Felson[1], Michael LaValley[1], James C. Torner[2], Cora E. Lewis[3], Micheal Nevitt[4], Joshua Stefanik[5]

INSTITUTIONS (ALL): 1. Rheumatology, Boston University, Boston, MA, United States.
2. University of Iowa, Iowa City, IA, United States.
3. University of Alabama at Birmingham, Birmingham, AL, United States.
4. University of California San Francisco, San Francisco, CA, United States.
5. Northeastern University, Boston, MA, United States.

Purpose (the aim of the study): Individuals with lower quadriceps strength are at increased risk of developing symptomatic knee osteoarthritis (OA) and functional decline over time, making it a key modifiable impairment. Despite the critical role of quadriceps strength, few studies have focused on predictors of strength and why it declines over time. Longitudinal analysis in the Multicenter Osteoarthritis Study (MOST) has shown that 30% of the cohort experiences a decline in quadriceps strength by more than 15% over 5 years. Identifying factors that affect quadriceps strength may allow for the identification of at-risk individuals and delivery of targeted treatments to preserve strength prior to disease progression. In experimental models, knee pain directly affects quadriceps strength through reflexive pathways; a phenomenon called arthrogenic muscle inhibition. However, the acute pain driving quadriceps inhibition in experimental models is substantially different than persistent pain characteristic of knee OA. Therefore, the purpose of this study was to characterize the associations between the presence of frequent knee pain and pain severity with quadriceps strength over 5-years in individuals with or at risk for knee OA.

Methods: MOST is an NIH-funded cohort study of older adults with or at risk of knee osteoarthritis (OA). At the baseline and 5-year visits, measurements were taken for height, weight, and knee extensor muscle torque (Newton-meters [Nm]) using isokinetic dynamometry at 60°/s. Frequent knee pain was assessed for each knee by asking: "*During the past 30 days, have you had pain, aching, or stiffness in your right/left knee on most days?*". Pain severity in each knee over the past 30 days was assessed on a 100-millimeter visual analog scale. We determined the relation of baseline presence of frequent knee pain and pain severity to quadriceps strength 5 years later, using generalized estimating equation (GEE) models to account for within-subject correlations between right and left knees. Models were stratified by sex and adjusted for baseline strength, age, presence of radiographic OA, race, and depressive symptoms. Exposures of interest were examined in separate models. Knee extensor torque was normalized to body mass (Nm/kg).

Results: Data from 2109 knees were included in each model (1860 participants, age = 62.2 ± 7.7 years, BMI = 30.6 ± 5.5 kg/m^2, Sex = 62.4% female). At baseline, prevalence of frequent knee pain was 40.1%, mean VAS pain was 18.4 ± 21.1 (median = 10.0), and prevalence of radiographic OA was 44.9%Presence of frequent knee pain at baseline was not associated with quadriceps strength at 5-years in females (β = -0.015 Nm/kg, 95% CI [-0.034, 0.009]) or males (β = 0.004 Nm/kg, 95% CI [-0.034, 0.046]). Pain severity at baseline was associated with lower quadriceps strength at 5-years in females (β = -0.055 Nm/kg, 95% CI [-0.080, -0.029]), but not in males (β = 0.000 Nm/kg, 95% CI [-0.001, 0.002]).

Conclusions: In individuals with or at risk of knee OA, baseline presence of frequent knee pain was not associated with quadriceps strength 5 years later. In females, higher baseline pain severity was associated with lower quadriceps strength at 5 years later, with a decrement of 0.55 Nm/kg per every 10/100 increase in pain severity. The findings suggest that pain severity, but not the presence of frequent knee pain, may be an important determinant of quadriceps strength changes over 5 years in females.

(No Table Selected)

TABLE FOOTER: (No Tables)

(No Image Selected)

KEYWORDS: Pain, Quadriceps, Longitudinal, Multicenter Osteoarthritis Study.

Type of Abstract: Clinical

If you have selected Other, please explain the type of abstract you are submitting: N/A

Early Career Investigator Awards: Yes

Need Based Travel Awards : No