Women with strong thigh muscles protected from symptomatic knee osteoarthritis

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A new study by researchers at the University of Iowa Hospitals and Clinics found that thigh muscle strength does not predict the occurrence of knee osteoarthritis (OA) uncovered in x-rays, but does predict incidence of painful or stiff knee OA. Women with the strongest quadriceps muscles appeared to be protected against the development of knee OA symptoms. Details of this study appear in the September issue of *Arthritis Care & Research*, a journal published by Wiley-Blackwell on behalf of the American College of Rheumatology.

The knee is the most common weight-bearing joint affected by osteoarthritis or degenerative joint disease, a major cause of disability in the U.S. The Centers for Disease Control and Prevention (CDC) estimate that
26.9 million U.S. adults are affected by OA with 16% (aged 45+ years) of those cases occurring in the knee. Approximately 18.7 % of symptomatic knee OA patients are female and 13.5% are male. A Medical Expenditure Panel Survey estimates that total out-of-pocket expenditures for treatment of arthritis was $32 billion in 2005.

Neil Segal, M.D., M.S., and colleagues in a study funded by the National Institute on Aging followed 3,026 men and women ages 50-79 over a 30-month period in the Multicenter Knee Osteoarthritis Study (MOST) to assess whether knee extensor strength would predict incident radiographic (OA that can be determined through X-ray) or symptomatic knee OA. Of those enrolled, a total of 2,519 knees were included in the study of radiographic knee OA and 3,392 knees were evaluated for the combination of radiographic OA and symptoms of OA that include pain, aching or stiffness on most days of the month.

Participants were evaluated for thigh muscle strength using an isokinetic dynamometer, a device that measures the strength of different muscle groups. The balance of muscle strength between quadriceps and hamstrings (H:Q ratio) was used to assess weakness in the lower extremity musculature. X-rays of the knees were taken at the onset of the study and the conclusion to determine the presence of OA. A telephone screen at the beginning and end of the study was conducted to establish if frequent pain, aching or stiffness was present in the knee. Data on height, weight (Body Mass Index-BMI), femoral neck bone mineral density (BMD), and physical activity status was also collected from participants.

By the conclusion of the study 48 of 680 men and 93 of 937 women developed OA detected by x-ray. At the end of the 30-month period 10.1% of women and 7.8% of men displayed signs of symptomatic knee OA. "Our results showed thigh muscle strength was not a significant predictor of radiographic knee OA," concluded the authors. Women in the top third of peak knee extensor strength had a lower incidence of symptomatic knee OA, while men with strong thigh muscles had only slightly better odds of developing OA symptoms compared to men with weaker knee extensor strength. "The H:Q ratios were not predictive of
symptomatic knee OA in either men or women," added researchers.

Researchers acknowledge there to be some limitation to the study by not including assessments of hip abductor strength. "Study of hip abductor strength, which is important for control of the knee joint, may be useful in a more comprehensive study of risk for OA of the knee," said Dr. Segal. "These findings suggest that targeted interventions to reduce risk for symptomatic knee OA could be directed toward increasing knee extensor strength," he added.

More information: "Effect of Thigh Strength on Incident Radiographic and Symptomatic Knee Osteoarthritis in a Longitudinal Cohort," Neil A. Segal, James C. Torner, David Felson, Jingbo Niu,

Leena Sharma, Cora E. Lewis, Michael Nevitt.
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