AMERICAN COLLEGE OF RHEUMATOLOGY
EDUCATION • TREATMENT • RESEARCH

Specialists in Arthritis Care & Research
1800 Century Place, Suite 250 • Atlanta, Georgia 30345-4300
Phone: (404) 633-3777 • Fax: (404) 633-1870 • www.rheumatology.org

Arthritis News

Media Contact: Tammy McCoy
(404) 633-3777 (until Oct. 15)
(210) 582-7010 (Oct. 16–Oct. 21)
tmccoy@rheumatology.org

Embargoed for Release at 6:15 PM ET, Sunday Oct. 17, 2004

GENETICS INDICATE PROPENSITY TOWARDS SEVERE OSTEOARTHRITIS

SAN ANTONIO, TEXAS—Genetics play a stronger role in the development of severe osteoarthritis than environmental factors, according to research presented this week at the American College of Rheumatology Annual Scientific Meeting in San Antonio, Texas.

Family history has already been proven a significant factor in predisposing patients to severe osteoarthritis. In fact, siblings run twice the risk of developing osteoarthritis in a particular joint as compared to the more distantly related family relatives. However, prior studies have not discriminated between genetic profiles and environmental factors that close family members also share.

To study genetics separately from the shared family environment, researchers identified patients treated with arthroplasty for diagnosed hip or knee osteoarthritis between 1987 and 2000 from the Swedish Discharge Register citing data on all hospital-based medical diagnoses and interventions. This database was then compared against the Swedish Twin Registry, which tracks more than 85,000 sets of twins. The goal was to identify whether monozygotic or dizygotic twins experienced more incidences of similar diagnosis and intervention. Monozygotic twins are genetically identical; dizygotic twins are non-identical and no more alike than any other siblings.

Researchers identified 972 twins who had hip surgery for hip osteoarthritis and 543 twins who underwent knee surgery for knee osteoarthritis. Identical twins were found to run five times the risk of developing severe knee or hip osteoarthritis that non-identical twins experienced.

"This demonstrates that a very large part of the heritability is due to shared genes and not family shared environment," said Stefan Lohmander, MD, Lund University, Lund, Sweden, and an investigator in the study. "Finding those genes may help us understand osteoarthritis and possibly treat it better."

The American College of Rheumatology is the professional organization for rheumatologists and health professionals who share a dedication to healing, preventing disability and curing arthritis and related rheumatic and musculoskeletal diseases. For more information on the ACR's annual meeting, see www.rheumatology.org/annual.

###

Editor's Notes: Dr. Lohmander will present this research during a scientific session at the ACR Annual Scientific Meeting from 12:15–2:00 PM CT (1:15–3:00 PM ET) on Monday, October 18, in Exhibit Hall C–D of the Henry B. González Convention Center. He will be available for media questions during a briefing at 8:30 AM CT (9:30 AM ET) on Monday, October 18, in the on-site Press Conference Room, Room 218.

Presentation Number: 228

Genetic Contribution to Severe Osteoarthritis of the Hip and Knee Leading to Arthroplasty. A Twin Study.

Stefan Lohmander[1], Olof Johnell[1], Nancy L. Pedersen[2]. [1]Lund University, Lund, Sweden; [2]Karolinska Institute, Stockholm, Sweden

PURPOSE: To assess the genetic and environmental contributions to severe OA of the hip and knee leading to joint replacement. The study of twins is a useful approach for the separation of genetic and environmental influences.

DESIGN: The population based Swedish Twin Registry (STR) contains more than 85 000 twin pairs. The Swedish Discharge Register (SDD) is also population based and contains data on all hospital based medical diagnoses and interventions. For years 1987–2000 inclusive we identified all cases with diagnosis of hip or knee OA combined with primary arthroplasty of hip or knee. This SDD derived database was run against the STR to identify female and male twins with this diagnosis-intervention combination. Standardized incidence rates (SIR) with 95% confidence limits were calculated for monozygotic (MZ) and same sex dizygotic (DZ) twins. Expected (EXP) number of twin pairs with both fulfilling diagnosis-intervention criteria 1987–2000 was calculated from national population data matched for year, age and sex.

RESULTS: We identified 972 twins with hip OA and primary hip arthroplasty, and 543 twins with knee OA and primary knee arthroplasty. The SIR for all twins, irrespective of zygosity or sex, with hip OA was 1.679 (1.238, 2.226), while that for knee OA was 1.801 (1.061, 2.846).

HIP	Twin pairs w. 1 case	Twin pairs w. 2 cases	EXP	SIR	Lower 95% limit	Upper 95% limit
MZ	192	25	6.548	3.818	2.471	5.636
DZ same sex	352	8	11.701	0.684	0.295	1.347
Ratio MZ/DZ				5.58	2.44	15.21

KNEE	Twin pairs w. 1 case	Twin pairs w. 2 cases	EXP	SIR	Lower 95% limit	Upper 95% limit
MZ	100	10	2.102	4.756	2.281	8.747
DZ same sex	211	5	4.324	1.156	0.375	2.698
Ratio MZ/DZ				4.11	1.28	21.25

CONCLUSION: The increased SIR for all twins with hip or knee arthroplasty for OA is consistent with a familial aggregation of both hip and knee OA. We further show a significantly increased casewise concordance in MZ over DZ twins for both hip and knee OA leading to arthroplasty. These results are consistent with a significant genetic contribution in both severe hip OA and severe knee OA leading to arthroplasty.

Disclosure: S. Lohmander, None; O. Johnell, None; N.L. Pedersen, None