



Paper #51

A Heritable Predisposition for the Need to Undergo Total Hip Arthroplasty

Christopher E. Pelt, MD, Jill A. Erickson, PA-C, Christopher L. Peters, MD, Mike B. Anderson, MS, ATC, Lisa Cannon Albright

Introduction: A heritable predisposition to osteoarthritis of the hip has been reported in the literature. The predisposition of osteoarthritis of the hip may lead to the need for total hip arthroplasty (THA). The purpose of the present study was to define population-based familial clustering among individuals treated with THA.

Methods: The Utah Population Database allows analysis of combined health and genealogic data for over two million Utah residents. We used the Current Procedural Terminology (CPT) codes (27091, 27130, 27135, 27090, 27137, 27138, 27252) and the Internal Classification of Diseases, 9th edition, codes (715.35, 996.66, 996.46) entered in patient records to identify patients that have experienced THA and their genealogic data. The hypothesis of excess relatedness (familial clustering) was tested with use of the Genealogical Index of Familiarity, which compares the average relatedness of affected individuals with expected population relatedness. Relative risks in relatives were estimated by comparing rates of disease in relatives with expected population rates (estimated from the population data).

Results: The Genealogical Index of Familiarity test for 1829 patients that have undergone THA showed a significant excess relatedness ($p < 0.001$), even when close relationships were ignored (dGIF $p < 0.001$), second degree (RR 1.37; 95% CI 1.07 – 1.72; $p < 0.001$) and third degree relatives (relative risk, 1.20; 95% CI 1.03 – 1.39; $p < 0.001$).

Conclusion: Excess relatedness of affected individuals and elevated risks to both near and distant relatives were observed, strongly supporting a heritable contribution for the necessity to proceed with hip arthroplasty. We also identified high-risk pedigrees in the Utah population, which can be studied to identify genes responsible for the need to undergo total joint arthroplasty. Identification of these genes may help in future treatment strategies designed to prevent the need for THA.
