

Prospective, Controlled Pilot Study of Serum Biomarkers in Patients Undergoing Hip Arthroscopy

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Summary:

This pilot study shows no significant difference in three established biomarker levels between hip arthroscopy patients and age-weight matched controls.

Abstract:

Introduction:

Premature hip osteoarthritis (OA) involves a progressive and often insidious inflammatory condition in which articular cartilage is mechanically degraded. Some studies have suggested elevated biomarkers in the presence of hip OA. The purpose of this study is to define the serologic phenotype expression of Vascular Cell Adhesion Molecule-1 (VCAM-1), Interleukin-6 (IL-6) and Cartilage Oligomeric Protein (COMP) in a human population of subjects undergoing arthroscopic hip surgery for prearthritic hip pain and to develop a clinical risk assessment model of hip arthritis based on these basic science findings.

Methods:

This is a prospective, case-controlled study. Following institutional review board approval, twenty subjects electing to undergo hip arthroscopy with single joint pain and no history of non-hip joint injury between the ages of 18 and 40 who are non-smokers and had radiographic Tönnis scores of 0-1 were selected. The control cohort consisted of ten age and weight matched subjects without hip pain or known OA who were also non-smokers. Serum biomarkers of VCAM-1, IL-6, and COMP were assessed. Both cohorts of subjects completed outcomes questionnaires to determine the progression, or lack thereof of osteoarthritis. Statistical analysis included t-test (significance $p < 0.05$) and Pearson Correlation Coefficients.

Results:

Ultimately, no statistically significant difference ($p > 0.05$) was found between the hip arthroscopy subjects and controls in the biomarkers VCAM-1, IL-6, and COMP. IL-6 had a small to medium correlation with the overall joint chondromalacia load and the acetabular chondromalacia load, respectfully. V-CAM-1 and COMP had no correlation with hip joint chondromalacia noted intraoperatively. The mHHS had a medium correlation with COMP levels in the operative group. The VHS and NAHS had strong correlations with VCAM-1 levels and medium correlations with IL-6 and COMP levels in the operative group. The mHOT and patient's BMI had a medium correlation with VCAM-1 and COMP levels and a small correlation with IL-6 in the operative group. Age did not correlate with biomarker levels in the operative group.

Conclusion:

This is a controlled, prospective, pilot study of serum biomarkers in a well-selected hip arthroscopy population. No statistical differences between groups were noted in three established biomarkers. Correlations between biomarker levels and clinical outcome scores were observed in the operative group; the strongest being between the Vail Hip

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Score/Non-Arthritic Hip Score and VCAM-1 serum levels at the time of surgery. More specific biomarkers are needed to assess and follow hip arthroscopy patients and surgical outcomes.