Contributing Factors to the Development of Glenohumeral Osteoarthritis in the Young Patient

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INTRODUCTION:

Glenohumeral osteoarthritis (GHOA) in young patients is a debilitating disease without a clear solution, and the factors leading to its development remain even more obscure. By illuminating these factors, early identification of patients who are at-risk of developing young GHOA is possible, leading to better nonsurgical management and potential delay of invasive arthroplasty. The purpose of this study is to identify what factors, genetic, rheumatologic, environment, traumatic, and atraumatic, are the most associated with young patients diagnosed with GHOA relative to a normal control group.

METHODS:

Following IRB approval, adult patients younger than 55 years-old were retrospectively identified and sorted into two groups: the case group consisted of patients diagnosed with GHOA before the age of 55 and the control group consisted of patients who had never been diagnosed with OA anywhere in their body and had never consulted with a shoulder and elbow surgeon. These two groups were sent a survey consisting of questions classified into 5 major groups: genetic, rheumatologic, environmental, traumatic, and atraumatic. The responses between these groups were compared to determine which factors where most associated with the development of GHOA in the young patient.

RESULTS:

A total of 413 patients were surveyed: 145 in the case group and 268 in the control. A family history of arthritis was significantly more common in the case group than the control. (40% vs 29%, $p=0.035$) Additionally, a paternal history of arthritis occurred at significantly greater rates in the young GHOA cohort. (17% vs 9%, $p=0.034$). Prior joint replacement was significantly more common in the case group, (19.1% vs 1%, $p=<0.001$), and the rate of familial history of rheumatologic diseased was significantly greater in patients with GHOA than without arthritis. A significantly greater proportion of patients with GHOA worked in manual labor for more than 1 year. (43% vs 0%, $p=<0.001$) Furthermore, 70% of patients in the case group participated in upper body weightlifting on a regular basis compared to 58% in the control. ($p=0.021$). A history of anabolic steroid use was also significantly more common in the case group. (9% vs 3%, $p=0.038$) Expectedly, a history of shoulder dislocation, fracture, and surgery occurred more frequently in the case group versus the control.($p<0.001$)

DISCUSSION AND CONCLUSION:

Genetic, environmental, and traumatic factors seem to be the most influential in the development of glenohumeral arthritis in the young patient. This points out there may be some inherited trait leading to the formation of less durable connective tissue which could be inherited paternally. Furthermore, heavily taxing the cartilage in the shoulder, such as in heavy manual labor, excessive upper body weightlifting, or in shoulder trauma, may cause greater shoulder wear and lead the formation of GHOA.