

THE POTENTIAL CONSEQUENCE OF A JOINT INJURY

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There is increasing high quality evidence that links sports participation with the occurrence of hip and knee Osteo-Arthritis (OA) in elite participants. The same evidence does not exist for non-elite sports participation.

Specifically for runners and walkers there is may be a protective rather than deleterious effect of exercise on joint health - studies have found no association between OA and non-elite long distance running, thus running does not "wear out joints". However, there is a suggestion that longer times playing sport or running may be associated with OA. Thus the physical activity and joint health dose-response relationship is incomplete.

All of these studies are beset with methodological issues and heterogeneity (age, self-report, recall bias) making meta-analyses difficult or impractical. A current piece of work looks to aggregate data from many global OA cohorts to help answer this question. The pathogenesis and presentation of OA is complex and variable typically relying on an interaction of genetic, systemic and mechanical factors leading to susceptibility of a joint to damage and failure of repair. Furthermore, we increasingly recognize a mismatch that exists between traditional markers of OA and symptoms – only 30-50% of patients with radiographic OA complain of knee pain.

Joint injury leads to OA through a complex interaction of systemic, biomechanical and inflammatory processes. A range of factors including injury severity, anatomical and biomechanical change, age and time from index injury, influences the likelihood of developing post- traumatic OA.

The consequence is pain and disability, with early identification of those at risk of OA providing an opportunity to intervene with therapy and risk factor modification. However, the prediction of post-injury OA and progression is a significant challenge as effective biomarkers are scant and currently tend to provide information too late. Additionally, early recognition and grading of injury is critical given that we know from radiological studies that 50% of ACL and 88% patellar subluxations can be missed in the emergency room. Radiological studies, principally Magnetic Resonance Injury (MRI), have demonstrated multiple changes in joints post-injury with a focus on knee. Stat and longitudinal examinations provide us with detailed analyses of inflammation, cartilage degeneration, bone bruising and early bone remodeling with changing shape of the joint. Increasingly useful MRI morphometry is providing 3-D and volume assessment of articular and meniscal cartilage, bone and muscle. This can be augmented by compositional MRI (dGEMERIC, T1-RHO, T2 mapping) to further evaluate joints - typically knee. These studies provide cartilage structural and metabolic data, which is helpful in evaluating early joint damage and progression.

In football, there may be an increased risk of OA that is thought to be linked to injury. This is significant as 47% of professional footballers retire due to injury. For knee OA, prior ACL injury and/or meniscectomy are now recognised as significant risk factors for OA. The level of OA in those football players retiring through injury is twice that of those retiring without injury. Furthermore the prevalence of OA hip and knee OA in elite players is considerably greater than non-elites (16% elite, 4% non-elite footballers and 1.6% controls).

Within professional football the overall risk of knee OA is subject to a large study through The Arthritis Research UK Centre for Sport, Exercise and OA. We know that demanding occupations and injury are risk factors for OA – we aim to quantify this for retired professional footballers.