ASSOCIATION BETWEEN OSTEOARTHRITIS-RELATED SERUM BIOCHEMICAL MARKERS OVER 11 YEARS AND KNEE MRI-BASED IMAGING BIOMARKERS IN MIDDLE-AGED ADULTS

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Background: Serum levels of osteoarthritis (OA)-related cartilage and joint-specific biochemical markers – cartilage oligomeric matrix protein (COMP), matrix metalloproteinase (MMP)-3, and hyaluronic acid (HA) – are shown to be associated with cartilage degradation, joint tissue degradation, and synovitis in patients with OA. Although these OA-related biochemical markers may initially precede the MRI markers of joint structural changes, such changes detected in MRI can lead to biochemical marker changes later as the condition progresses. However, there is a lack of data on OA-related biochemical markers’ association with MRI-based biomarkers in the middle-aged general population.

Objectives: To evaluate the associations between OA-related biochemical markers and MRI-based imaging biomarkers in middle-aged adults followed up over 10-13 years.

Methods: Blood samples were collected during the Childhood Determinants of Adult Health (CDAH)-1 study at baseline (year: 2004-06, age: 26–36 years) and 10-13 year follow-up (CDAH-3; year: 2014–2019, age: 36–49 years). Serum samples from baseline (n=156) and follow-up (n=167) were analyzed for 3 OA-related biomarkers – namely COMP, MMP-3, and HA – using non isotopic ELISA assay methodology. Knee MRI scans were obtained during the CDAH-knee study (year: 2008-10, age: 30-40 years, n=313), and MRIIs were assessed for cartilage volume, cartilage thickness, subchondral bone area, cartilage defects, and bone marrow lesions (BML). Univariable and multivariable (adjusted for age, sex, BMI, race/ethnicity, smoking status) linear regression and logistic regression were used to describe the association of biochemical marker at CDAH-1 and MRI-based imaging biomarkers at CDAH-knee and biochemical markers at CDAH-3.

Results: In the multivariable model for the association of biochemical marker with MRI-based imaging biomarkers (assessed after 4 years), we found a significant negative association of COMP with medial femorotibial compartment cartilage thickness (-0.010 (-0.019, -0.000) p=0.045), and MMP-3 with patellar cartilage thickness (-9.075 (-13.344, -1.807) p=0.015) and total bone area (-0.047 (-0.086, -0.007) p=0.020). No significant association was observed between HA and MRI markers.

Conclusion: COMP and MMP-3 levels were negatively associated with knee cartilage thickness assessed 4 years later. Similarly, knee cartilage thickness and volume were negatively associated with COMP and MMP-3 levels assessed 6-9 years later in population-based middle-aged adults, indicating an independent negative association of OA-related biochemical markers and MRI-based imaging biomarkers. These results suggest that OA-related biochemical markers may predict future MRI-based imaging biomarkers in middle-aged adults and thus represent possible at-risk populations to target for structure modification interventions.

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ASSOCIATION BETWEEN HYPERTENSION AND OSTEOARTHRITIS

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Background: Hypertension is a common comorbidity in patients with knee osteoarthritis (OA). Although these biomarkers may initially precede the MRI markers of joint structural changes, such changes detected in MRI can lead to biochemical marker changes later as the condition progresses. However, there is a lack of data on OA-related biochemical markers’ association with MRI-based biomarkers in the middle-aged general population.

Objectives: To evaluate the relationships between arterial hypertension (AH) and the course of knee osteoarthritis (OA).

Methods: Data were drawn from the Adelphi OA Disease Specific Programme (2017-18), a point-in-time survey of primary care physicians (PCP), rheumatologists (rheums), orthopaedic surgeons (orthos) and their OA patients. Patients with physician-diagnosed knee OA were included and segmented into two categories: those with previous surgery (PS) and those with knee surgery (NS). A Fisher’s exact test was performed on the two groups. Physicians reported on patient demographics; whether patients had undergone surgery; type of surgery; success of surgery; how success was defined; and reasons for wanting to delay surgery. Patients reported their willingness to undergo surgery; reasons for not wanting surgery; how successful their surgery was; how they defined this success; and what was the main trigger for their request was one of their main triggers for recommending surgery (45% vs 20% in the US; 84% vs. 68% in the EU5). The main reason for patient reluctance to undergo surgical interventions, and clinicians may choose to avoid or delay surgery due to safety risks and/or the financial cost. It is of interest to understand if the use and perception of surgery differs between countries, however, few published data exist.

Conclusion: Patients are looking for higher levels of efficacy. Some patients are reluctant to undergo surgical interventions, and clinicians may choose to avoid or delay surgery due to safety risks and/or the financial cost. It is of interest to understand if the use and perception of surgery differs between countries, however, few published data exist.

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