

A SYSTEMATIC REVIEW OF RISK FACTORS AND DIAGNOSTIC METHODS FOR HAND INTERPHALANGEAL JOINT OSTEOARTHRITIS PROGRESSION

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Abstract:

Purpose: The economic burden from osteoarthritis (OA) has been estimated at \$10 billion annually in the USA alone. With an aging population globally, more patients with OA are likely to progress in their disease, and it is anticipated that this year OA will be the fourth leading cause of disability worldwide. Hand OA is the most prevalent type of radiographic OA. However, it is not yet well-known which factors put patients at risk of hand OA progression. There is also no established consensus on how hand interphalangeal joint (IPJ) OA progression should be measured. Therefore, this systematic review aimed to identify risk factors for the progression of IPJ OA, and diagnostic methods used to measure IPJ OA progression.

Methods: The study was reported following the PRISMA Statement and the review was registered on PROSPERO (CRD42019121034). A specialist in-house librarian assisted with the development of search terms for i) hand and finger, ii) osteoarthritis, and iii) progression. The search criteria were modified for use on Medline, Embase, Scopus, and The Cochrane Library, and searches were conducted from inception until October 2018. Inclusion criteria consisted of cohort studies which assessed the relationship between a potential risk factor and IPJ OA progression. Studies were excluded if IPJ OA data could not be separated from other types of arthritis, or OA in other joints. Two independent reviewers initially screened titles and abstracts, and then reviewed full text articles and extracted data. Any disagreement was settled through a consensus meeting with a third, independent reviewer. A modified Quality in Prognosis Studies Tool was used to assess risk of bias. A meta-analysis was not performed due to heterogeneity in study design and risk factor assessed.

Results: The search produced 22,344 articles, and after removal of duplicates 11,588 remained. 11,536 were excluded at title and abstract screening, leaving 32 for full text review. Of these, nine studies met inclusion criteria. All studies in this review were categorised as high risk of bias; the most common reason being lack of adjustment for other important risk factors. Of the 16 potential risk factors that were studied (Table 1), risk factors for IPJ OA progression were: older age (3 studies), female gender (1 study), larger epiphyseal finger index (1 study). One study found Type 2 diabetes was associated with IPJ OA progression when progression was defined as an increase in the number of IPJs with Kellgren-Lawrence score 2 or more at follow up compared to baseline. However, in the same study, Type 2 diabetes was not associated with IPJ OA progression when progression was defined as an increase of more than 1 in the summed Kellgren-Lawrence score at follow up compared to baseline. Two studies found contrasting findings related to alcohol consumption and IPJ OA progression. One study found 4-7 alcoholic drinks per week was associated with IPJ OA progression, whilst other quantities showed no association. A different study found no association between alcohol consumption measured on a continuous scale, and IPJ OA progression. All studies measured OA progression radiographically (no studies assessed change in symptoms or clinical signs). All studies used the Kellgren-Lawrence classification system, and one study also used the Kallman atlas. Four studies defined progression as an increase by at least 1 point in the summed Kellgren-Lawrence score at follow up compared to baseline. One of these studies used a second outcome measure, which defined progression as an increase in the number of IPJs with Kellgren-Lawrence score of 2 or more at follow up compared to baseline. Two studies defined progression as an increase by at least 1 point in Kellgren-Lawrence grade of any IPJ at follow up compared to baseline. Two studies defined it as an increase of at least 1 point in Kellgren-Lawrence grade at follow up of the IPJ with the highest scoring Kellgren-Lawrence grade at baseline.

Conclusions: Most risk factors were only investigated in one study, and all studies were of high risk of bias. There is a need for high-quality research, adjusting for multiple confounders and investigating possible interactions between risk factors. Older age at diagnosis was found to be a risk factor for faster IPJ OA progression compared to younger age (under 40 years old) in three studies. Further research should focus on strategies to prevent or reduce the rate of disease progression, particularly in an aging population. The Kellgren-Lawrence classification system was most commonly used to measure IPJ OA progression. There are currently no guidelines on how the Kellgren-Lawrence system should be interpreted to quantify OA progression. Future work should consider establishing a definition for IPJ OA progression. This would allow data to be pooled across studies.