

RISK FACTORS FOR THE INCIDENCE OF HAND INTERPHALANGEAL JOINT OSTEOARTHRITIS- A SYSTEMATIC REVIEW

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Abstract:

Purpose: Radiographic hand osteoarthritis (OA) is the most prevalent type of OA in the general population. Unlike the hip and knee, where joint injury and excessive load are known to be strong risk factors for OA development, the risk factors for the development of hand OA are not yet well recognised. Furthermore, OA at the base of the thumb and the finger interphalangeal joints (IPJs) are now considered to be separate disease processes, and therefore are likely to have different aetiology. OA at the base of thumb has been more widely researched in the literature, whilst research on IPJ OA is still scarce and has not yet been reviewed systematically. The aims of this systematic review were to identify risk factors for the incidence of hand IPJ OA, and to summarise the methods used to diagnose the incidence of hand IPJ OA.

Methods: This review was prospectively registered on PROSPERO (CRD42019116782) and PRISMA guidelines were followed. Search criteria were developed in consultation with a healthcare librarian, with terms for hand and finger, osteoarthritis, and development. Medline, Embase, Scopus, and The Cochrane Library, were searched from inception until October 2018.

Abstracts and titles were assessed for eligibility by two independent reviewers. To be eligible for inclusion, articles must have reported the incidence of IPJ OA either radiographically or clinically, and investigated a risk factor and its association with incident OA. Ineligible studies were those on paediatrics/ animals/ cells/ cadavers, reports/ abstracts/ letters, and studies where IPJ OA results could not be separated from other joints or from inflammatory arthritis. Full text articles were assessed and data extracted by two reviewers, with disagreement settled by consensus with a third reviewer. Risk of bias was assessed using a modified Quality in Prognosis Studies Tool. Studies were heterogeneous in design, risk factor analysis, and outcome measure, so a meta-analysis could not be performed.

Results: 22,344 articles were found, with 11,588 remaining after removal of duplicates. 11,526 titles and abstracts were excluded, with 179 full text articles assessed for eligibility.

Overall, 29 studies were included in the systematic review. Six studies had a moderate risk of bias whilst 23 had a high risk of bias. Unclear study characteristics and a lack of adjusting for potential risk factors were the most common reasons for high risk of bias. Of the 29 studies, 28 diagnosed OA radiographically. The most commonly used radiographic atlas was the Kellgren-Lawrence classification system (23 studies). Three studies required either radiographic or clinical signs to be present, whilst 3 studies required both radiographic and clinical features for a diagnosis. Studies most commonly diagnosed OA at the row or hand level. Of the 35 potential risk factors that were analysed, 9 were associated with an increased risk of incident IPJ OA (Table 1): greater grip strength (1 high risk of bias study), Kashin-Beck Disease (1 high risk of bias study), foot OA (1 moderate risk of bias study), base of thumb OA (1 high risk of bias study), family history of OA (3 high risk of bias studies), higher insulin-like growth factor-1 (1 high risk of bias study), human leukocyte antigen (HLA)-DR2 (1 moderate risk of bias study), multiple single nucleotide polymorphisms (SNPs) on the interleukin-1 gene (1 high risk of bias study), and genetic risk factors (single nucleotide polymorphism (SNP) rs9340799 on chromosome 6 (1 moderate risk of bias study), SNP rs1982073 on chromosome 19 (1 moderate risk of bias study), linkage disequilibrium on chromosomes 4 (1 high risk of bias study) and 7 (1 moderate risk of bias study). Seventeen potential risk factors were not associated with IPJ OA incidence. Multiple studies found no association between smoking (4 high risk of bias studies), or physical activity level (2 high risk of bias studies) and incident IPJ OA.

Conclusions: Despite a large number of articles included in this review, few variables were found to be risk factors for the development of IPJ OA. Most potential risk factors were investigated by a single study, most studies were of high risk of bias and few studies adjusted for multiple confounders, highlighting the need for further high quality research.