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Hand osteoarthritis and generalized osteoarthritis: a need for clarification

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Summary

A proportion of patients with osteoarthritis (OA) have polyarticular involvement and are categorized as having generalized OA (GOA). However, a widely accepted definition of GOA does not exist. The topography of affected joints as well as the threshold number of affected joints used in defining GOA remain unidentified. According to number, site and clustering of affected joints, various subtypes of GOA, possibly related to different genetic factors, may exist. Such subtypes have still to be clearly identified. Among them, the association of hand and knee OA emerges as a probable subtype. Polyarticular involvement of hand joints is common, but may include various subtypes of differing significance. Further studies are needed to clarify the definition of GOA. © 2000 OsteoArthritis Research Society International

Key words: Hand osteoarthritis, Generalized osteoarthritis.

Introduction

Most frequently, symptomatic osteoarthritis (OA) patients consult their physicians with unilateral or bilateral, but single localization of the disease. In such patients a careful clinical or radiological examination may find OA in other joints. However, evidence of OA affecting different sites in the same patient is more commonly demonstrated by epidemiological studies. The term 'generalized OA' (GOA) is often used to describe such patients. In fact, to describe GOA more precisely is a difficult and conflictual task. A review of the literature clearly shows that definition of GOA is quite variable and rarely results from data-based analyses.

Hand OA often affects multiple joints and is frequently considered to be GOA. However, the term GOA is also used to describe patients who have OA in different sites, with or without hand involvement. In addition, consideration of intervertebral disc degeneration renders the situation more complex.

Classification of OA patients cannot be considered anecdotally since clear differentiation of the type of disease is necessary to study genetic factors and biochemical markers. In this paper, we will review the definition of hand OA and GOA, as well as the value of using the diagnosis of hand OA as a marker for OA at other sites in the body.

Definition of hand OA

The classification of hand OA by the American College of Rheumatology (ACR)¹ is widely used. The classification tree, shown in Table I, is both sensitive and specific. It is striking to note that the method includes only patients with

Table I

ACR classification criteria for osteoarthritis of the hand. Classification tree format (Altman et al. 1990)

- | | |
|-------|--|
| 1. | Hand pain, aching or stiffness
and |
| 2. | Hard tissue enlargement of two or more of 10 selected
joints
and |
| 3. | Fewer than three swollen MCP joints
and either |
| 4(a). | Hard tissue enlargement of two or more DIP joints
or |
| 4(b). | Deformity of two or more of 10 selected joints |

The 10 selected joints are the second and third DIP, the second and third PIP, and the first trapezometacarpal.

The second and third DIP joints may be counted in both items 2 and 4(a). This classification method yields a sensitivity of 92% and a specificity of 98%.

Key: ACR: American College of Rheumatology; MCP: metacarpophalangeal; DIP: distal interphalangeal; PIP: proximal interphalangeal.

symptoms, does not use any radiography and does not make any distinction between the various joints of the hand.

The requirement of clinical symptoms for the definition of hand OA is debatable. A good concordance, close to 80%, between symptoms and radiographic OA (ROA) has been reported.^{1,2} Moreover, symptoms are reported in a minority of patients with normal hand joints as determined by X-ray. Symptoms were also reported in a minority of patients presenting with hand ROA.³ Similarly, only 70% of patients diagnosed as having hand OA, according to the ACR criteria, still had the disease 6 months later when using the same criteria.⁴ Thus, symptoms can be considered to be marginal criteria in the definition of hand OA and there is no reason to differentiate hand OA subsets according to their presence or absence.

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Structural changes in the joint offer the best definition of OA. Related to their superficial localization, some structural OA changes can be evaluated by a simple physical examination. For example, Heberden's nodes typically reflect the presence of osteophytes in the distal interphalangeal (DIP) joints. Physical examination, as an alternative to X-ray for definition of hand OA, has been evaluated and was found to be more sensitive than X-ray in symptomatic patients¹ but of less value in unselected patients.^{2,5} Erosive hand OA is clearly a subset of hand OA which can only be distinguished with accuracy by radiography.⁶ This subset differs from non-erosive OA by the potential of bone ankylosis, a finding seen more often in spondylarthropathies than in OA. Identification of this subset could be of interest for genetic studies, justifying from a different point of view the usefulness of radiography for hand OA definition.

Finally, the ACR definition of hand OA combines items from several different joints in the hand, i.e. DIP joints, proximal interphalangeal (PIP) joints and the first carpometacarpal (CMC) joints. OA at any of these sites, alone or in various combinations, may make up subtypes which could be of interest in the classification of hand OA for genetic studies.

Hand OA as a generalized disease of hand joints

The frequency of multiple hand joint involvement has been shown by Kellgren and Moore⁷ in outpatients. They also suggested that the frequency distribution of joint involvement was bimodal and thus primary GOA could be identified as a subtype of OA. Evidence of a clustering of involved joints has been confirmed in population based studies,^{8,9} of which symmetry was the most striking pattern. Prevalence of OA in one joint of a particular row markedly increased the prevalence or incidence of OA in other joints of the same row. OA in one hand joint also increased the risk of OA in any other hand joint. However, clustering by ray (DIP, PIP and MCP joints of the same finger), as well as relation between CMC OA and digital OA, were much less important.⁸⁻¹⁰

Thus, in at least a portion of patients, predominantly women, OA emerges as a polyarticular disease. GOA is the term often used to classify patients with OA in two or more other sites (DIP, PIP, MCP, CMC joints). However, as previously mentioned, possible combinations of various involved sites may illustrate potential subsets of hand OA which have still to be identified.

Generalized OA and hand OA as markers of OA at other joints

Definition of GOA by the existence of polyarticular hand OA alone is simple and easy to use, but is not widely accepted. GOA is also often used to define patients having polyarticular disease in both small and large joints. Affected joints are often those which most frequently degenerate, such as hands, knees, feet and spine.^{11,12} Alternatively, the diagnosis of GOA could also be reserved for patients with early onset of polyarticular disease, affecting typical as well as atypical sites such as shoulders or elbows. Such a GOA has been reported in OA linked to an autosomal dominant mutation in type II procollagen.¹³ GOA has also been subclassified into a nodal (presence of Heberden's nodes

and a non-nodal disease,⁷ a fact implying that GOA and hand OA are not synonymous. Dougados *et al.*¹⁴ also suggested the existence of two subtypes of GOA, one defined by the presence of bilateral hand OA (whatever the site) and the other defined by the presence of both spine OA and bilateral knee OA. Finally, the threshold number of affected joint groups for the definition of GOA is an important question which remains unanswered. Involvement of three or five joint groups has been proposed.⁷ However, such a threshold could not be identified in a population based study.¹⁰

Thus, identification and characterization of various possible subtypes of GOA clearly remains to be done. Several reports indicate that hand OA is frequently associated with OA in other joints.^{5,10,12,15-18} Involvement of hand and knee joints was clearly observed more frequently than could be expected by chance alone and after adjustment for age.^{12,15,17,18} Interestingly, association was not limited to patients with polyarticular hand OA but was also found in patients with OA at only one site in the hand.¹⁷ The percentage of patients with both hand and knee OA was low, ranging from 2% to around 30%.^{5,17} A genetic factor for hand and knee OA has also been reported.¹⁹ However, a human aggrecan gene polymorphism allele was found to be significantly associated with hand OA but not with knee OA.²⁰ An association of hand OA with hip OA, albeit a weak one^{10,15,18} has been suggested, at least in cases with severe joint space narrowing.¹⁶ Association of hand OA with OA at other sites (feet, spine) has been reported^{12,21} but further studies are needed in order to reach any firm conclusions.

Conclusion

Evidence for the existence of polyarticular OA is given by epidemiological studies. The term GOA is widely used to describe such patients but the definition of GOA varies between studies and has not been fully agreed upon. According to the site of OA, the clustering of affected joints and a threshold number of affected joint groups, various definitions of GOA can be made and several subtypes of GOA might also exist. Among the differing subtypes, the association of hand and knee OA emerges as a probable one. However, a clearer definition of GOA is needed.

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