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## Short Communication

# On the Etiology of Heberden's Nodes

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"What are those little hard knobs, about the size of a small pea, which are frequently seen upon the fingers, particularly a little below the top near the joints?" This question, which was asked by the 18th century physician Heberden, is still essentially unanswered. This is probably due partly to the fact that the nodes give no or only very slight subjective symptoms. The problem is still a topical one, however, in view of the numerous occurrences of these nodes, the question of differential diagnosis against rheumatic polyarthritis, and not least their obscure etiology.

An important contribution to the discussion on the origin of Heberden's nodes was made in 1941 by Stecher (14), who pointed out the significance of heredity in the form of an autosomal gene, dominant in women and recessive in men. In a material of 171 women over 40 years of age, the same author (15) found nodes in 53% and states that their frequency in women is ten times greater than in men. Kellgren & Moore (5) distinguished from classical degenerative arthritis and from rheumatoid arthritis a "primary generalized osteoarthritis" as a distinct clinical entity, with Heberden's nodes as one of its most characteristic features. Among 120 women with a mean age of 52 years 103 had nodes, 79 had arthrosis in the first carpometacarpal joint and 62 had both these changes. Concerning the etiology the latter authors were in agreement with Stecher and describe tha joint changes as a hereditary, constitutional disorder. They point out, however, that the provoking factor in the acute stage is still unknown.

The significance of trauma in the development of Heberden's nodes has been mentioned by several authors (13, 16), who state that this refers especially to their appearance in men. It seems more difficult to suppose such a causal relationship in women, among whom these nodes are most common. There has been no lack of attempts to clarify this question. General expressions such as "Melckerknötchen" and "working the fingers to the bone" contribute to the argument. Radin and co-workers (13) have shown experimentally that with certain finger movements the pressure in distal finger joints is considerably higher than in other joints. These authors consider that a woman's hand movements are characterized more by precision than by power, as in men. In the former case flexion is produced by the flexor digitorum profundus muscle, which exerts its action mainly on the distal joint, whereas in the latter case it is produced by the flexor digitorum sublimis, which in accordance with the same theory primarily causes compression in other, more proximal joints. It was considered that these mechanical conditions might explain the higher frequency of the nodes in women, and their distal localization.

Heberden's nodes have of course also been associated with the long recognized menopausal polyarthrites which have been described under different names. The hormonal changes prevailing at this stage of life, which are regarded as an important factor in the occurrence of joint symptoms, also seem to be a cause of other metabolic-hormonal diseases of interest. Bienenstock & Fernando (1), for example, state that in many cases of Heberden's nodes obesity, diabetes mellitus and signs of acromegaly appear at the same time. Morgagni's syndrome, described by Henschen (3), is manifested under comparable endocrine conditions. Originally consisting of adipositas and virilism, and with hyperostosis frontalis interna (HFI) as the cardinal symptom, the syndrome has now been complemented by diabetes mellitus (4). Most authors now seem to regard combinations of these symptoms as the result of pituitary hyperfunction. In a

small series of cases the present author previously found a positive correlation between HFI and Heberden's nodes, which were described as "subacromegalic" (8). This was one attempt to explain the characteristic peripheral location of the nodes.

In order to investigate the role of Heberden's nodes in this connection, their presence or absence was noted in 164 post-menopausal women who consecutively, and for various reasons, attended the medical outpatient clinic of Köping Hospital. Nodes of varying sizes were found in 73 cases, i.e. 44%. In a similarly collected group of women who had diabetes mellitus in addition, 59 positive cases were noted out of 100, i.e. 59%. The first-mentioned percentage figure should thus represent the normal frequency of Heberden's nodes in this patient category. The relation between these nodes and diabetes mellitus seems to be well documented. Still closer is their relation to HFI. Among 62 women with this latter symptom 57 had Heberden's nodes, i.e. 92%. Clearly these joint changes can also be associated with Morgagni's syndrom, which in its original form seems much too limited. It is evident from a previous investigation that HFI is usually combined with general thickening of the skull and an enlarged Atlas diameter (7). In these cases the frontal hyperostosis forms part of a more general bone proliferation. Supporting this view is the presence of osteoarthrosis in different joints in patients with HFI (2, 6). Among their cases of primary generalized osteoarthritis, characterized mainly by Heberden's nodes, Kellgren & Moore (5) found simultaneously appearing humero-scapular periarthritis, carpal tunnel syndrome and tendinits. In early articles the author has associated such cases with HFI (9, 10, 11, 12) and has pointed out the common origin, a general connective tissue hyperplasia. It seems reasonable to assign Heberden's nodes to the same group of symptoms. As a part of the hereditary, hypophyseally induced constitutional anomaly which the author has designated *involutional acromegaly* (9), the sex and age distribution of Heberden's nodes and their centrifugal localization would seem to be explainable.

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