Susceptibility, Vulnerability and Heterogeneity in Osteoarthritis

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I. INTRODUCTION

Two people with the same age, body weight and occupational joint loading may have very different osteoarthritis (OA). One has radiographic change and no pain, another has early disabling pain, a third progresses rapidly. Conventional Medicine approaches this through susceptibility, vulnerability and phenotypic heterogeneity. Homoeopathic philosophy approaches it through Hahnemann's concept of susceptibility. This article describes both and compares them without equating them.

II. BIOLOGICAL SUSCEPTIBILITY AND HETEROGENEITY

OA is now regarded as a disease of the whole joint, involving cartilage, subchondral bone, synovium and periarticular tissues, rather than simple wear (Hunter & Bierma-Zeinstra, 2019). Individual differences arise from interacting influences. Risk rises with age and is higher in women after midlife. Obesity adds mechanical load and also acts through metabolic and adipose-related pathways, which may explain its association with hand OA. Previous injury, malalignment and abnormal loading largely determine which joint is affected and how quickly it deteriorates. Low-grade synovitis is present in a subset of patients and relates to symptoms and progression. Stress, mood, sleep and social circumstances shape pain and disability, partly independent of structural damage.

From these interactions emerge proposed phenotypes, such as post-traumatic, metabolic, inflammatory and pain-sensitisation-dominant OA, though their boundaries overlap and their clinical usefulness is still being tested (Deveza et al., 2019). Heterogeneity therefore appears in presentation, rate of progression, pain, functional limitation and response to treatment. The frequent mismatch between radiographs and symptoms illustrates this. Vulnerability here is a probabilistic, population-derived estimate of risk, not a fixed property of the individual.

III. SUSCEPTIBILITY IN HAHNEMANNIAN PHILOSOPHY

In the Organon of Medicine, Hahnemann describes disease as a dynamic derangement of the vital force (§9, §11). He holds that harmful influences do not overpower everyone equally; they cause illness only when the organism is sufficiently disposed and susceptible to them (§31). Susceptibility is thus the individual's capacity to be affected, a property of the whole person rather than of a tissue, gene or pathway. Kent and Close elaborate this as individual predisposition, which explains why one person is affected by a cause, and in what manner, while another is not. It underlies the Homoeopathic emphasis on individualisation. These remain philosophical propositions, not experimentally established mechanisms.

IV. COMPARATIVE PERSPECTIVE

Both frameworks begin from the same observation: exposure alone does not explain outcome. They differ in foundation, scope and limitation. Biomedical susceptibility rests on epidemiological, genetic and mechanistic evidence. It is specific, measurable and open to revision, but its predictive power for the individual is modest and it can under-represent the whole-person experience. Hahnemannian susceptibility rests on a vitalistic, clinical-philosophical model. It is global and qualitative, but it

cannot currently be operationalised or measured. It should therefore not be equated with genetic risk, immune responsiveness, inflammatory activity or biological vulnerability, since these arise from different theoretical foundations and address different dimensions of human response.

V. CONCLUSION

Variation in OA is multifactorial and clinically important. Understanding individual differences strengthens individualised clinical thinking, provided biomedical science and Homoeopathic philosophy are each kept within their own epistemological boundaries.

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