

ORIGINAL PAPER

Unequal brothers : are homeopathy and hormesis linked?

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The debate between those who believe homeopathy and hormesis derive from the same root and those who believe the two are different phenomena is as old as hormesis. It is an emotionally loaded discussion, with both sides fielding arguments which are far from scientific. Careful analysis of the basic paradigms of the two systems questions the claim of the homeopaths, who find similarities between them. The authors discuss these paradigms, indicating the differences between the claims of homeopathy and hormesis. It is time for thorough and serious research to lay this question to rest. One possible approach is to compare the activity of a hormetic agent, prepared in the usual way, with that of the same agent in the same concentration prepared homeopathically by serial dilution and succussion. Homeopathy (2015) 104, 97–100.

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This following constellation is not uncommon: two siblings, one of them bright and accomplished, the other a dull under-achiever, condescended to or even ridiculed. Understandably, the accomplished sibling downplays or even denies the connection between them, while his brother stresses it, reaching for the relationship's reflected glory.

This tale of two siblings is a useful metaphor for the complex relationship between hormesis and homeopathy. Homeopathy practitioners (in the role of under-achieving sibling) cling desperately to hormesis as a possible scientific proof of homeopathy. Hormesis experts, on the other hand, try to shake themselves free from any such idea, regarding homeopathy as unscientific and fantastical.

This emotionally charged relationship has dogged homeopathy since hormesis was first described 100 years ago. The German Organization of Classical Homeopathy's information sheet, for example, bases its proof of the efficacy of homeopathic remedies on the 'hormesis' effect which has been 'known for a long time'.¹ Nils Mengler of the University of

Giessen in Germany cites hormesis in his dissertation as a possible mechanism of homeopathic action.² These are examples of a large number of studies and publications in the homeopathic literature claiming that homeopathic and hormetic mechanisms have the same roots. The successful sibling's response to these claims, on the other hand, can be found in, EJ Calabrese's "*Historical Blunders: How Toxicology Got The Dose-Response Relationship Half Right.*" Calabrese, a leading hormesis researcher, argues that the "hormetic dose-response model (formerly known as the Arndt-Schulz Law) was rejected principally because of its close historical association with the medical practice of homeopathy."³ Opponents of hormesis, continues Calabrese, attack the theory by "unfair association" with "segments of the homeopathic movement." That is, the 'successful sibling' is "banned from the club" because of his association with his inadequate brother.

What makes homeopathy homeopathic?

The primary pillar of homeopathic theory is the Law of Similars, according to which a substance that causes certain symptoms of disease in the healthy may cure similar symptoms in the sick.⁴ A second basic principle is that the therapeutic effects of homeopathic medications are highly specific, customized to the unique presentation

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of the disease in each individual. A third critical principle is the method of production of homeopathic medicines. As Hahnemann states in his *Organon of Medicine*⁵:

“This remarkable change in the qualities of natural bodies (i.e., the externalization of the inner medicinal powers of the crude substance) develops the latent, hitherto unperceived, as if slumbering, hidden, dynamic powers which influence the life principle, change the well-being of animal life. This is effected by mechanical action upon their smallest particles by means of rubbing and shaking and through the addition of an indifferent substance, dry or fluid, are separated from each other. This process is called dynamizing, potentizing (development of medicinal power) and the products are dynamizations or potencies in different degrees.”

In simple terms, Hahnemann is saying that to derive medicinal power from a substance, whether inert or biologically active, that substance must be ‘dynamized’ by a serial dilution. Diluted with a liquid, it must be vigorously shaken between each dilution step (succussion). When prepared from an insoluble solid, trituration in a mortar is required.

Although Hahnemann was contemporary with Avogadro, it is unlikely he was familiar with Avogadro’s numbers of constituent particles. The potencies he used were considerably higher than those of Avogadro (up to $30C = 10^{-60}$), and his followers increased those potencies up to $10^{-200,000}$.

The aim of homeopathic treatment is a “rapid, gentle and permanent restoration of the health, or removal and annihilation of the disease in its whole extent.”⁶ That is, homeopathy eradicates the disease either with a single dose (classic homeopathy) or multiple doses (clinical homeopathy), and continued application of the remedy is unnecessary.

Homeopathic remedies can be either toxic or inert in pharmacological, non-homeopathic doses. Also an inert substance will reveal a therapeutic effect provided that it is prepared according the homeopathic principles described above.

Homeopathic responses have different ‘amplitudes’ (strengths) and different ‘widths’ (lengths of action): they can achieve a ‘maximally possible action’ (cure), lasting from seconds to years, depending on the patient’s ‘vital force’, the pathology’s type and severity, and the remedy’s potency.

All this must be taken together in any homeopathic system, classical or clinical. Otherwise it cannot be called a homeopathic system.

What makes hormesis hormesis?

Hormesis is a biphasic dose–response phenomenon, characterized by a low-dose stimulation or beneficial effect and a high-dose inhibition or toxic effect.^{7,8} The term hormesis was coined in 1943 by Southam and Ehrlich⁹ to describe the growth stimulation of wood-decaying fungi in cedar wood induced by low doses of natural antimicrobial

agents. Despite the fact that the roots of hormesis can be traced at least to the ancient Greeks, it is traditionally attributed to the work of German pharmacologist Hugo Schulz and psychiatrist Rudolph Arndt in the early 20th century.

In recent years, hormesis has been confined to the areas of radiation biology, toxicology and sometimes to biochemistry. The extensive work of Calabrese *et al.*, described in thousands of publications, shows this phenomenon can be traced in different models and using different agents, that include chemicals, temperature, radiation, exercise, energy intake and others — suggesting it is a generalizable biological phenomenon.^{9–11} Its effects are non-specific and may be induced by several agents in one specific model. The magnitude of the stimulatory hormetic effects can be observed within a very narrow range of concentrations, namely between the ‘no observed adverse effect level’ (NOAEL) and concentration zero. As a rule, the effect is modest, not usually exceeding 30 to 60 percent of the control response. The width of the stimulatory response is typically within a 100-fold of the zero equivalent point.¹² All this must be taken together in any hormetic system in order to be called a hormetic system.

It seems there are few subjects in science which cause as much controversy as hormesis. Its association with homeopathy is certainly one reason for this. In recent years, however, a renaissance can be observed, establishing a certain position for hormesis within radiation biology and toxicology. In other fields, it remains marginalized.

Are there common features between these two paradigms? (Table 1)

An examination of common features between homeopathy and hormesis requires comparison of the cornerstones of the two paradigms — that is, the characteristics that distinguish one from the other, and from any other model. In homeopathy, to elicit a predicted response, a remedy must be adjusted to the *specific* cluster of symptoms in the individual patient. The hormetic response, however, is typically, as mentioned above, *nonspecific* and can be caused by a series of agents. This fundamental difference can be compared to attempting to open a door with a specific key or with a master-key.

The homeopathic response to a correctly prescribed single dose of a single remedy is a unique effect, usually comprising a series of physical, mental and/or emotional changes, whose stages, temporality, size and duration are hard to predict. It may be called a ‘multidimensional and multidirectional change.’ It will, in a complex way (for example, ‘first aggravation’, Hering’s Law), improve the overall condition of the biological system in which the homeopathic effect was induced.¹³ In contrast, a hormetic effect is usually simple, predictable and repeatable.

An increase or decrease in dosage in a homeopathic system will not impact on the direction of the effect, but may change its quality, producing a stronger or weaker mental emotional and physical influence. Such a change can also impact on the effect’s duration, with high potency (more

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