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Plausibility bias and the controversy around homeopathy

Homeopathy has long been surrounded by controversy. As long ago as 1846 it was denounced as 'ludicrously absurd' and an 'outrage to human reason'[1] and more recently it has been claimed that 'Accepting that infinite dilutions work would subvert more than conventional medicine; it wrecks a whole edifice of chemistry and physics'.[2]

The latest high profile episode was the publication of the Commons Science and Technology Committee report in February 2010, which concluded that 'There has been enough testing of homeopathy and plenty of evidence showing that it is not efficacious', called for it to be banned from the NHS and for no further research to be conducted.[3] This report was heavily criticised, particularly for its failure to take evidence from a single patient who had experienced homeopathic treatment and from only one practitioner (me), while calling a number of well-known sceptics including representatives of Sense about Science, a lobby group which has campaigned stridently against homeopathy. An Early Day Motion critical of the report was signed by 70 MPs. The government's response rejected the suggestion that the Department of Health take the 'unusual step of removing PCTs' flexibility to make their own decisions', and declined to rule out further research funding.[4]

Yet despite the long history of controversy, homeopathy shows no sign of fading away. On the contrary, sales are steadily rising, it has international popularity and, according to the NHS Choices website, the Royal London Hospital for Integrated Medicine (formerly the Royal London Homoeopathic Hospital) is the hospital most recommended by its patients in the entire NHS.[5]

Lack of consensus

How can we account for this sharp lack of consensus and can anything be done about it? The debate is not principally about the basic idea of homeopathy 'like cures like'. This idea is reflected in the toxicological and pharmacological concepts of hormesis, rebound effects and paradoxical pharmacology; all are paradoxical effects of drugs and toxins as a function of dose or time[6-10] and depend on the body's reaction, rather than the primary effect of the drug. Homeopathy is based on the systematic exploitation of such effects. The controversial aspect of homeopathy is its use of very dilute medicines, including so-called 'ultramolecular' dilutions, diluted beyond the point at which (according to Avogadro's Law) the starting substance persists.

This is a fundamental scientific problem and some scientists argue that homeopathy 'doesn't work because it can't work', so any apparent effects must be due to placebo. Contrary views have also been expressed: 'demanding more evidence may itself be considered unscientific; the same level of supporting clinical trial evidence should be accepted for all scientific developments. If a lower level of proof is set for hypotheses that fit prior beliefs then we bias our view of science in favour of such beliefs and may be easily misled'.[11] However, there is evidence from clinical trials that homeopathy is effective in conditions including diarrhoea, fibromyalgia, 'flu, hay-fever, osteoarthritis, sinusitis and vertigo, and that these are not due to placebo. A systematic review of clinical trials stated, 'we would accept that homoeopathy can be efficacious, if its mechanism of action were more plausible'.[12]

But clinical trials are a clumsy way to deal with basic scientific questions and test tube research is growing. The best established method utilises the Human Basophil Degranulation Test – a test tube model of allergic response. The finding that homeopathic dilutions of histamine inhibit basophil degranulation has been verified repeatedly by different scientific teams.[13]

Beyond this is the question of how these effects are mediated. Although the work is preliminary, many believe that 'nanostructures' in water may be involved. Supporters of this view include the Nobel Laureate, Luc Montagnier, who has published remarkable results supporting this hypothesis, although these await independent replication.[14]

Plausibility bias

Responding to these issues Lex Rutten, George Lewith, Robert Mathie and I have recently introduced the concept of 'plausibility bias' based on analysis of the discrepancy between evidence

and practice in the treatment of upper respiratory tract infection (URTI).[15]

The introduction of antibiotics was a revolution and has saved countless lives, but it is clear that there is little place for them in uncomplicated URTI. They do little good: they do not reduce the risk of serious complications and are ineffective in otitis media.[16,17] But they do significant harm: acute otitis media recurs more frequently in young children treated with antibiotics than those given placebo and their use leads to increased antibiotic resistance.[18,19] URTI is the most prevalent disease category in general practice and despite widespread awareness of the need to reduce the use of antibiotics for URTI, they are still frequently prescribed.[20,21] Meanwhile there is evidence from clinical studies of varying designs that homeopathy may be effective in treating acute otitis media.[22,23]

We concluded that the differing conclusions of the meta-analyses of the homeopathy and conventional medicine subsets, and particularly the homeopathy URTI subset, do not reflect the nature of the evidence, nor its quality, but negative 'plausibility bias'. Negative plausibility bias obstructs a fair evaluation of the evidence around homeopathy; its extent and implications have not been adequately recognised or discussed. It should not impede further research, but we must recognise that such new research in homeopathy, if positive, may have limited impact on practice until a plausible theoretical framework is established.

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References

1. Forbes J. Homoeopathy, allopathy and "young physic". Brit and Foreign Med Rev 1846: 225-265
2. Vandenbroucke JP, de Craen JM. Alternative medicine: a ''mirror image'' for scientific reasoning in conventional medicine. Ann Intern Med 2001;135:507–513
3. www.publications.parliament.uk/pa/cm200910/cmselect/cmsctech/45/4502.htm
4. www.official-documents.gov.uk/document/cm79/7914/7914.pdf
5. Williams D. Patients more satisfied with hospitals than GP services. HSJ 24 March 2011 www.hsj.co.uk/news/primary-care/patients-more-satisfied-with-hospitals-than-gp-services/5027475.article
6. Stebbing ARD. Hormesis the stimulation of growth by low levels of inhibitors. Sci Total Environ 1982;22:213-234
7. Calabrese EJ, Blain R. The occurrence of hormetic dose responses in the toxicological literature, the hormesis database: An overview. Toxicol Appl Pharmacol 2005;202:289–301
8. Calabrese EJ, *et al*. Drug development and hormesis. Changing conceptual understanding of the dose response creates new challenges and opportunities for more effective drugs. Curr Opin Drug Discov Devel 2006;9:117–123
9. Bond RA. Is paradoxical pharmacology a strategy worth pursuing? Trends Pharmacol Sci 2001;22:273-6
10. Teixeira MZ. Bronchodilators, fatal asthma, rebound effect and similitude Homeopathy 2007;96:135-7
11. Chaplin MF. The memory of water: an overview. Homeopathy 2007;96:143–150
12. Kleijnen J, *et al*. Clinical trials of homoeopathy. BMJ 1991;302:316–323
13. Endler PC, *et al*. Repetitions of fundamental research models for homeopathically prepared dilutions beyond 10-23: a bibliometric study. Homeopathy 2010;99:25-36
14. Montagnier L, *et al*. Electromagnetic signals are produced by aqueous nanostructure derived from bacterial DNA sequences. Interdiscip Sci Compu Life Sci 2009;1:80-91
15. Rutten L, Lewith G, Mathie RT, Fisher P. Homeopathy in upper respiratory tract infections? The impact of plausibility bias. www.webmedcentral.com/article_view/1126
16. Petersen I, *et al*. Protective effect of antibiotics against serious complications of common respiratory tract infections: retrospective cohort study with the UK General Practice Research Database. BMJ 2007;335:982
17. Glasziou PP, *et al*. Antibiotics for acute otitis media in children. Cochrane Database Syst Rev 2004; CD000219
18. Bezáková N, *et al*. Recurrence up to 3.5 years after antibiotic treatment of acute otitis media in very young Dutch children: survey of trial participants. BMJ 2009;338:b2525
19. Costelloe C, *et al*. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: systematic review and meta-analysis. BMJ 2010;340:c2096
20. El Sayed MF, *et al*. Prospective study on antibiotics misuse among infants with upper respiratory infections. Eur J Pediatr 2009;168:667-72
21. Li J, *et al*. Antimicrobial prescribing for upper respiratory infections and its effect on return visits. Fam Med 2009;41:182-7
22. Bornhöft G, *et al*. Effectiveness, safety and cost-effectiveness of homeopathy in general practice – summarized health technology assessment. Forsch Komplement 2006;13 Suppl 2:19-29
23. Bellavite P, *et al*. Immunology and homeopathy. 4. Clinical studies – Part 1. Evid Based Complement Alternat Med: eCAM 2006;3:293–301