

Homeopathy: A Critique of Current Clinical Research

An evaluation of the clinical research by the group that has published most of the papers in homeopathy, 2005–2010, finds numerous flaws in the design, conduct, and reporting along with a tendency to overinterpret weak data.

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Homeopathy has remained one of the most controversial medical treatments in the world. It is based on the “like cures like” principle and the idea that serial dilution of a substance renders it not less but more potent. Both of these axioms of homeopathy lack biological plausibility (Sehon and Stanley 2010). Nevertheless, homeopathy was recently cited as one of “the most popular and widely used forms of medicine in the world” (Chatfield 2011).

Advocates of homeopathy argue that homeopathy’s “clinical effectiveness cannot be disputed” (Chatfield 2011). To prove their point, they produce evidence that seems to confirm this assumption (Fisher 2011). Critics tend to counter that these data are seriously flawed—so much so that they cannot be relied upon (Bewley et al. 2011).

The aim of this article is to critically evaluate the clinical research of the research group that, in recent years, has published most of the clinical research in homeopathy.

Methods

Medline searches were conducted to identify the team that, in the period between 2005 and 2010, had published more original, clinical research in homeopathy than any other group worldwide. Subsequently, all their publications were obtained and read in full. Data were extracted according to pre-defined criteria (Table 1). Each article was then critically evaluated.

Results

The most prolific research group in this area was identified to be from Berlin. Within the last five years, this team

published a total of eleven clinical studies (Brinkhaus et al. 2006; Keil et al. 2008; Teut et al. 2010; Witt et al. 2005a; Witt et al. 2009a; Witt et al. 2005b; Witt et al. 2008; Witt et al. 2009c; Witt et al. 2009b; Witt et al. 2010; Witt et al. 2011) (Table 1). The articles refer to randomized clinical trials and cohort studies published in both conventional ($n=7$) and alternative medical journals ($n=4$). Most of the articles have major limitations, which will be discussed below.

Discussion

Homeopathy is not an area of buoyant research activity; the fact that one center published eleven clinical studies of homeopathy within five years is remarkable. The eleven publications fall in three categories: randomized clinical trials (RCTs); cohort studies without controls; cohort studies with controls. These will be discussed in turn.

Three RCTs of homeopathic arnica were published in one single article (Brinkhaus et al. 2006). They all included patients undergoing arthroscopic knee surgery and all used change in knee circumference after surgery as the primary outcome measure. The first study

included 227 patients with arthroscopy, the second thirty-five patients with artificial knee joint implants, and the third fifty-seven patients with cruciate ligament reconstructions. No power calculations were provided. The first two RCTs showed no significant effect of peri-operative homeopathic arnica D30 compared to placebo. The third RCT did demonstrate a significant reduction of 1.8 percent. The authors also mention a post-hoc pooled analysis of all three RCTs that revealed a borderline significant effect ($p=0.04$). They conclude that “patients receiving arnica showed a trend toward less post-operative swelling compared to patients receiving placebo” (Brinkhaus et al. 2006) and recommend that the observed effects “seem to justify the use of homeopathic arnica in cruciate ligament reconstruction” (Brinkhaus et al. 2006). The authors did not critically discuss the clinically irrelevant reduction in knee circumference. The stated aims include investigating the safety of homeopathic arnica, yet the sample size is far too small for identifying rare adverse effects. No conflicts of interest were mentioned in the article (Brinkhaus et al. 2006).

This cohort study was submitted to a multitude of analyses that (so far) have been published in a total of seven articles (Teut et al. 2010; Witt et al. 2005b; Witt et al. 2008; Witt et al. 2009c; Witt et al. 2009b; Witt et al. 2010; Witt et al. 2011). The first two of them refer to the results at year two (Witt et al. 2005b), the third at year eight (Witt et al. 2008). The stated aims of the two- and eight-year follow up are, however, remarkably different

Key data from all included investigations

First author (year) ^[ref]	Condition	Study design	Study aim (quote)	Sample size	Journal type	Conclusion (quote)	Conflicts of interest (funding)
Brinkhaus et al. (2006)	3 different types of knee surgery	3 p.c. d.b. RCTs	"...to investigate the effectiveness and safety of homeopathic arnica..."	1) 227 2) 35 3) 57	Alt. Med.	"... patients receiving homeopathic arnica showed a trend towards less postoperative swelling..."	n.m. (n.m.)
Witt et al. (2005b)	Any	Prospective, multicentre cohort study	"to determine the spectrum of diagnoses and treatments as well as the course of disease over time among patients who chose to receive homeopathic treatment"	3981	Conv. Med.	"... homeopathic medical therapy may play a beneficial role in the long-term care of patients with chronic diseases."	n.m. (Carstens Foundation)
Witt et al. (2008)	Any	Prospective, multicentre cohort study	"... to evaluate health status changes under homeopathic treatment in routine care"	3709	Conv. Med.	"Patients who seek homeopathic treatment are likely to improve considerably"	n.d. (Carstens Foundation)
Witt et al. (2009c)	Atopic eczema	Prospective, multicentre cohort study	"... present the subgroup of children with atopic eczema followed up for 24 months"	225	Conv. Med.	None	n.m. (Carstens Foundation)
Witt et al. (2011)	Psoriasis	Prospective, multicentre cohort study	"To evaluate details and effects of homeopathic treatment in patients with psoriasis in usual medical care"	82	Conv. Med.	"Under classical treatment, patients with psoriasis improved in symptoms and QoL."	n.m. (Carstens Foundation)
Witt et al. (2009b)	Dysmenorrhea	Prospective, multicentre cohort study	"Evaluating homeopathic treatment for dysmenorrhea"	128	Conv. Med.	"Patients with dysmenorrhea improved under homeopathic treatment"	n.d. (Carstens Foundation)
Teut et al. (2010)	Any condition of elderly patients	Prospective, multicentre cohort study	"... to determine the spectrum of diagnoses and treatments, as well as to describe the course of illness among older patients who chose to receive homeopathic treatment"	83	Conv. Med.	"The severity of disease showed marked and sustained improvements under homeopathic treatment"	n.d. (Carstens Foundation)
Witt et al. (2010)	Migraine	Prospective, multicentre cohort study	"... to evaluate details and possible effects of an individualized homeopathic treatment in patients with migraine in usual care"	212	Alt. Med.	"... patients seeking homeopathic treatment for migraine showed relevant improvements that persisted for the observed 24 months"	n.d. (Carstens Foundation)
Witt et al. (2005a)	5 selected chronic disorders: • Headache • Low back pain • Depression • Insomnia • Sinusitis	Comparative cohort study	"To evaluate the effectiveness of homeopathy versus conventional treatments in routine care"	493	Alt. Med.	"Patients seeking homeopathic treatment had a better outcome overall compared with patients on conventional treatment, whereas total costs in both groups were similar"	n.m. (n.m.)
Keil et al. (2008)	Children with eczema	Comparative cohort study	"To assess... whether homeopathic treatments could influence eczema sign/symptoms and quality of life compared with conventional treatment"	118	Alt. Med.	"... both therapy groups improved similarly regarding perception of eczema symptoms... and disease related quality of life"	n.m. (Innungskrankenkasse, Hamburg)
Witt et al. (2009a)	Children with eczema	Comparative cohort study	"To examine the effectiveness, safety and costs of homeopathic versus conventional treatment in usual care."	135	Conv. Med.	"... homeopathic treatment was not superior to conventional treatment..."	n.m. (Robert Bosch Foundation)

p.c. = placebo controlled; Alt. Med.= alternative medicine; Conv. Med.= conventional medicine; d.b. = double-blind; sig = significant; n.m.= not mentioned; n.d. = not declared

(Table 1). The authors recruited 103 primary care practices in Germany and Switzerland employing homeopathy. All patients consulting the homeopathic physician for the first time were included regardless of diagnosis. About 68 percent of the patients "believed" in homeopathy. The main outcome measures were patients' and physicians' assessment of complaints. The questionnaire used for children had been validated, but

the other outcome measures had been developed by the researchers themselves and had not been formally validated. All patients underwent an initial consultation by their homeopathic doctor lasting two hours on average.

Despite the multiple publications, only scant details were provided in the articles about the actual treatments administered. In one article, "recording all treatments" was mentioned in the meth-

ods section, but the results did not provide these details (Witt et al. 2011). Half of the patients also consulted non-study physicians who were not necessarily homeopaths (Witt et al. 2005b). In the article reporting the eight-year follow-up (Witt et al. 2008), the authors state that "all physicians were completely free to choose a treatment"; presumably this included conventional therapies as well.

Despite the fact that patients had been recruited regardless of their medical condition, the conclusions of one of the articles refer to “patients with chronic diseases” (Witt et al. 2005b). The authors stress repeatedly that cause and effect cannot be inferred in a study of this nature. Yet, they repeatedly imply causal inferences, for example: “younger patients and those with more severe disease appear to benefit most from homeopathic treatment” (Witt et al. 2005b); “the effect must not be attributed to homeopathic treatment alone” (Witt et al. 2008) (implying that at least part of it can be); “fully cured: 12.2%” (Witt et al. 2011); “under homeopathic treatment the severity of the disease and the quality of life improved substantially, which supports the ‘whole person’ approach prevailing in contemporary homeopathy”; “homeopathic medical therapy may play a beneficial role in the long-term care of older adults with chronic diseases” (Teut et al. 2010).

The subsequent publications of this study relate to subgroups of patients with specific conditions at the two-year follow-up (Teut et al. 2010; Witt et al. 2009c; Witt et al. 2009b; Witt et al. 2010; Witt et al. 2011) (Table 1). The two-year follow-up results were published in two strikingly similar articles (Becker-Witt et al. 2004; Witt et al. 2005b). One of them falls outside the reporting period of the present analysis (Becker-Witt et al. 2004), and it is therefore only mentioned in the discussion of my analysis. In none of these articles was the disease in question diagnosed according to rigorous criteria. Even though sample sizes were often low (Table 1), the authors believe their results are “representative” (Witt et al. 2011).

All of these publications report highly encouraging results for homeopathy. The possibility that these findings might not be due to the treatment but caused by the natural history of the disease, regression toward the mean, placebo effects, the therapeutic relationship, other context effects, or a mixture of any of these factors is repeatedly mentioned but then either dismissed or deemed unlikely. In some instances, even the stated aim of the article seems

to imply causality: “evaluate . . . effects of homeopathic treatment” (Witt et al. 2011), “our study was designed to evaluate homeopathic treatments” (Witt et al. 2011), “evaluating homeopathic treatment” (Witt et al. 2009b), “to evaluate . . . effects of an individualized homeopathic treatment” (Witt et al. 2010). Conflicts of interest were often not mentioned, but if they were, none were declared. Some of the articles in this series stated that the research was funded by the Carstens Foundation, an organization well-known for its pro-homeopathic stance.

The third category of articles (Keil et al. 2008; Witt et al. 2005a) is based on comparative cohort studies. For the

ter was only available for 38 percent of patients, which seems to invalidate any conclusions regarding cost. Yet the authors fail to discuss this point critically and present these data as valid. The results seem to indicate that homeopathy “had a better overall outcome compared to . . . conventional treatment” (Witt et al. 2005a). The obvious fact that this could be due to a range of factors, including the lower age of these patients or the additional attention by homeopaths, is not critically discussed.

The data of the same study were submitted to a subgroup analysis of 118 children suffering from eczema (Witt et al. 2005a). In this paper, the authors again imply causal inferences that, due to the

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first of these investigations, 493 patients with five selected chronic conditions were recruited by 101 homeopathic and fifty-nine conventional study physicians. These patients had chosen homeopathic and conventional healthcare according to their own beliefs and preferences. Therefore, the two groups yielded numerous significant differences at baseline, e.g., conventional patients were seven years older, had used more medical services in the past, and were more likely to be male. Half of the homeopathic cohort used conventional treatments in addition to homeopathy. Only scant details were provided about the treatments administered in each group.

The main outcome measures included a non-validated symptom score, quality of life, and overall costs. The lat-

study design, are not warranted, e.g., “the extent of the improvement was significantly different, in favour of homeopathically treated patients” or “. . . it is noteworthy that the outcome was at least similar (by patients’ assessment) or significantly superior (by physicians’ assessment) to conventional treatment” (Keil et al. 2008). Again, the study is presented as though it was a comparison of homeopathy with conventional care, while it was, in fact, a comparison of homeopathy plus conventional care versus conventional care alone.

Witt et al. also published a separate but similar comparative cohort study with children suffering from eczema (Witt et al. 2009a). Again, the parents had selected either homeopathic or conventional based on their beliefs. Consequently, there were multiple baseline

differences between the relatively small groups (n=48 and 87). Only scant details were provided about the treatments used in both groups. In particular, it is unclear to what extent the homeopathic physicians also employed conventional treatments. Neither was it clear on what basis the physicians decided to include some patients and exclude others. The primary outcome measure was a validated symptom score administered by blinded evaluators. The results showed no inter-group differences at six or twelve months, but a graph provided in

in this area. It also reveals multiple publications of similar data, which might be regarded as ethically debateable. Most important, it points to a phenomenon that, according to my experience, seems to be common in this line of investigation (Ernst 2010): relatively weak data tend to be over- or misinterpreted to such an extent that the casual reader of such publications can be seriously misled. Consequently, homeopathy appears to have clinical effects which, with critical analysis, can be attributed to bias or confounding.

My evaluation suggests numerous flaws in the design, conduct, and reporting of clinical research in homeopathy recently published by the most prolific research unit in this area.

the article depicts a steeper decline of the symptom score in the homeopathy group. The costs for homeopathic patients were about twice of those of the control group. Closer inspection of the results reveals that, because the homeopathic group was more severely ill at baseline, the apparent improvement in this group might have been due to a more pronounced regression toward the mean. Yet this possibility was not discussed by the authors of this paper.

This critical analysis is, of course, limited by the fact that only the publications of one research group were scrutinized. Thus, generalizations across the field of homeopathy are not permissible. Nevertheless, my evaluation suggests numerous flaws in the design, conduct, and reporting of clinical research in homeopathy recently published by the most prolific research unit

Future research in this area should be more rigorous and readers of biased research papers should apply appropriately critical assessments. ■

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