Homeopathy. 2015 Jan;104(1):3-8. DOI: 10.1016/j.homp.2014.11.001. Epub 2014 Dec 17.

## Veterinary homeopathy: meta-analysis of randomised placebo-controlled trials

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PMID: 25576265 DOI: 10.1016/j.homp.2014.11.001

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BACKGROUND: Meta-analysis of randomised controlled trials (RCTs) of veterinary homeopathy has not previously been undertaken. For all medical conditions and species collectively, we tested the hypothesis that the outcome of homeopathic intervention (treatment and/or prophylaxis, individualised and/or non-individualised) is distinguishable from corresponding intervention using placebos.

METHODS: All facets of the review, including literature search strategy, study eligibility, data extraction and assessment of risk of bias, were described in an earlier paper. A trial was judged to comprise reliable evidence if its risk of bias was low or was unclear in specific domains of assessment. Effect size was reported as odds ratio (OR). A trial was judged free of vested interest if it was not funded by a homeopathic pharmacy. Meta-analysis was conducted using the random-effects model, with hypothesis-driven sensitivity analysis based on risk of bias.

FINDINGS: The combined odds ratio for the 89 studies entered into the main meta-analysis was 2.45 (95% CI 2.05, 2.93) in favour of homeopathy. The odds ratio for the 26 good-quality studies was 1.66 (1.33, 2.08), and that corrected for publication bias was 1.78 (1.03, 3.10). Four studies on the effects of a single remedy on seasonal allergies had a pooled odds ratio for ocular symptoms at 4 weeks of 2.03 (1.51, 2.74). Five studies on postoperative ileus had a pooled mean effect-size-difference of 0.22 standard deviations (95% CI -0.36, -0.09) for flatus, and -0.18 SDs (-0.33, -0.03) for stool (both p < 0.05).

RESULTS: Nine of 15 trials with extractable data displayed high risk of bias; low or unclear risk of bias was attributed to each of the remaining six trials, only two of which comprised reliable evidence without overt vested interest. For all N = 15 trials, pooled OR = 1.69 [95% confidence interval (CI), 1.12 to 2.56]; P = 0.01. For the N = 0.02.

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Study or Subgroup	log[Odds Ratio]	SE	Weight	Odds Ratio IV, Random, 95% CI	Year	Odds Ratio  IV, Random, 95% CI
A11. Wolter 1966	5.02	1.528	1.7%	151.41 [7.58, 3025.48]	1966	
A09. Kayne 1994	-0.462	1.537	1.6%	0.63 [0.03, 12.81]	1994	
A28. Williamson 1995	-0.094	0.489	7.4%	0.91 [0.35, 2.37]	1995	<del></del>
A10. Searcy 1995	1.595	0.426	8.2%	4.93 [2.14, 11.36]	1995	
A26. Guajardo-Bernal 1996	0.816	0.412	8.3%	2.26 [1.01, 5.07]	1996	-
A22. Albrecht 1999	0.507	0.206	10.9%	1.66 [1.11, 2.49]	1999	-
A05. de Verdier 2003	-0.2	0.551	6.7%	0.82 [0.28, 2.41]	2003	<del></del>
A01. Hektoen 2004	0.562	0.606	6.1%	1.75 [0.53, 5.75]	2004	<del></del>
A06. Fidelak 2007	0.039	0.514	7.1%	1.04 [0.38, 2.85]	2007	
A04, Cracknell 2008	0.247	0.523	7.0%	1.28 [0.46, 3.57]	2008	<del></del>
A23. Arlt 2009	-0.315	0.174	11.3%	0.73 [0.52, 1.03]	2009	
A07. Hielm-Björkman 2009	1.929	0.831	4.2%	6.88 [1.35, 35.08]	2009	
A27. Soto 2010	0.122	0.459	7.7%	1.13 [0.46, 2.78]	2010	
A24. Camerlink 2010	1.358	0.604	6.1%	3.89 [1.19, 12.70]	2010	_ <del></del>
A02. Werner 2010	0.445	0.647	5.7%	1.56 [0.44, 5.55]	2010	<del></del>
Total (95% CI)			100.0%	1.69 [1.12, 2.56]		•
Heterogeneity: Tau2 = 0.37; C	hi <sup>2</sup> = 43.07, df = 14	(P < 0.1	0001);  2=	67%		-lll -l-
Test for overall effect: Z = 2.49 (P = 0.01)					0.05 0.2 1 5 20 Favours placebo Favours homeopa	

CONCLUSIONS: Meta-analysis provides some very limited evidence that clinical intervention in animals using homeopathic medicines is distinguishable from corresponding intervention using placebos. The low number and quality of the trials hinders a more decisive conclusion.

**KEYWORDS**: Meta-analysis; Placebo control; Randomised controlled trials; Systematic review; Veterinary homeopathy

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