

PRESS RELEASE
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HOMEOPATHY AND ANTIMICROBIAL RESISTANCE

Antimicrobial resistance (AMR) i.e. bacteria becoming resistant to antibiotic treatment, is a major concern in modern health care¹ driven partly by excessive and inappropriate use of antibiotics². This global challenge has resulted in the development of action plans, such as the “European One Health Action Plan against AMR”, in which the EU asks, amongst other actions, for more research on new treatments which could help to reduce the use of antibiotics³. Several studies have shown that homeopathy could have a useful role to play in this field. In the following, examples of three such studies are presented.

What are the studies about and what is their added value?

- **Study on upper respiratory tract infections**

The EPI3⁴ survey is a large-scale French observational study⁵, which assessed homeopathic treatment in primary care for i) musculoskeletal, ii) sleep, anxiety and depressive disorders and iii) upper respiratory tract infections (URTIs).

The study on URTIs⁶ is particularly interesting, as this indication accounts for 60% of antibiotic prescriptions in primary care.

It showed that patients treated by GPs certified in homeopathy were found to have similar clinical outcomes to patients using conventional medicine alone, but with reduced use of conventional drugs (antibiotics and antipyretic/anti-inflammatory drugs) and at 20% lower overall cost⁷.

This survey brings valuable information on the possible role of homeopathy in tackling the AMR problem. It was conducted according to best practices in pharmaco-epidemiology, as shown in a recent analysis which evaluated its methodology⁸.

- **Study on complicated urinary tract infections**

Recurrent urinary tract infections (UTIs) are a common clinical challenge in patients with neurogenic lower urinary tract dysfunction (NLUTD) due to spinal cord injury (SCI). This prospective study compared antibiotics, and non-antibiotic treatments (most commonly homeopathy), for non-febrile urinary tract infections (UTIs) in such patients. The study found no significant difference between the two treatment groups in terms of prevention of recurrent urinary tract infections⁹.

Therefore, non-antibiotic therapies, such as homeopathy, seem to be a feasible first-line treatment option in complicated UTIs in patients with NLUTD, as long as there is no fever. This finding is noteworthy, as antibiotics are currently the only treatment recommendation for complicated UTIs in the current guidelines.

- **Study on *Escherichia coli* diarrhoea in neonatal piglets**

In a triple-blinded randomised placebo-controlled trial, neonatal piglets, whose mother sows had been treated with homeopathy, had significantly less diarrhoea than piglets from sows who had received placebo during gestation¹⁰.

High use of antibiotics in veterinary medicine is a worldwide issue contributing substantially to the development of AMR. In the organic farming sector, use of antibiotics is therefore restricted, being partly replaced by complementary medicines like homeopathy.

The ‘piglet’ study provides important data by studying neonatal diarrhoea caused by *Escherichia coli*, which is one of the most common illnesses in swine and which is conventionally treated by antibiotics. The study used high-quality trial methodology, like

blinding of treatment administration, observation, and statistical analysis. In addition, the quality of this evidence was rated as trustworthy using widely recognised Cochrane¹¹ methods¹².

Deep dive: Study setups, results and discussions

• Study on upper respiratory tract infections / EPI3 survey

Description and results:

- EPI3 is a nationwide cohort study that comprises a representative sample of 825 GPs and their patients in France (2007-2008). For the URTI cohort, 518 patients with this confirmed diagnosis participated in a standardised telephone interview and were observed for one year.
- The results showed that patients treated by certified homeopathic GPs (GP-Ho) had a significantly lower consumption of antibiotics (odds ratio (OR)¹³ =0.43, 95%-CI¹⁴:0.27-0.68) and antipyretic/anti-inflammatory drugs (OR=0.54, 95%-CI:0.38-0.76) compared to the patients treated by GPs using conventional medicine (GP-CM). Symptoms had a similar evolution in both groups (OR=1.16, 95%-CI: 0.64-2.10).
- There was a slightly higher, but statistically non-significant, rate of potentially URTI-associated infections like otitis media and sinusitis reported by patients treated by GPs-Ho for one year (17.7%) compared to patients treated by GPs-CM (16.9%).

Discussion:

- At first glance, there could be concern that the different characteristics of patients seen by GPs-Ho at the start of the study, compared with those treated by GPs-CM, may have influenced the results. Such differences between groups of patients are unavoidable in these types of non-randomised real-world studies. However, a statistical method was used to remove this potential problem (an adjustment for confounding¹⁵) so we know differences between the groups did not alter the results.
- An independent critique of the methodology used for the EPI3 study also concluded that this 'non-comparability' between groups was properly addressed through advanced analytic techniques (propensity scores).

• Study on complicated urinary tract infections

Description and results:

- This prospective study observed patients with neurogenic lower urinary tract dysfunction (NLUTD) due to spinal cord injury (SCI) with 3 or more UTIs per year for 12 months. At the onset of an UTI, patients could choose between antibiotic and non-antibiotic treatment¹⁶.
- Of the 199 non-febrile UTIs which occurred during the observation period, patients chose antibiotic treatment in 104 events whereas in 95 events, patients chose non-antibiotic treatment (n=80) or no treatment at all (n=15).
- Success rates were 78.8% for antibiotic treatment, 67.5% with non-antibiotic treatment and 26% without therapy. No patient in the non-antibiotic group developed febrile UTI or required hospitalization. Homeopathy was the most frequently used therapy in this group.

Discussion

- This study was a sub-analysis from a trial showing that adjunctive homeopathic treatment leads to a significant decrease of (recurrent) UTIs in SCI patients. This means that most patients were familiar with homeopathy and had already used it, which might have influenced the results.

- **Study on *Escherichia coli* diarrhoea in neonatal piglets**

Description and results:

- In this triple-blinded randomised placebo-controlled trial, 52 sows were treated twice a week during their last month of gestation either with the homeopathic medicine *Coli 30K*¹⁷ (26 sows) or with placebo (26 sows). The 525 piglets from these sows were scored for occurrence and duration of diarrhoea.
- In the placebo group, 23.8% of the piglets suffered from diarrhoea versus 3.8% in the homeopathy group. This 6-fold difference favouring homeopathy is highly significant ($p < 0.0001$).
- Mean duration of diarrhoea was slightly shorter in the homeopathy group (1.3 days) compared to the placebo group (1.86 days). Even if not significant, the variance of half a day can make large differences in the overall development of piglets.

Discussion:

- As homeopathy is a therapy which is based on individual symptoms, the effectiveness of this treatment may possibly also be influenced by farm-specific conditions, such as breed. Therefore, replications of this study on different farms is recommended as a next step.

¹ Cassini A, Diaz Högberg L, Plachouras D, Quattrocchi A, Hoxha A, Skovantibiotic Simonsen G, et al. Attributable deaths and disability-adjusted life-years caused by infections with antibiotic-resistant bacteria in the EU and the European Economic Area in 2015: a population-level modelling analysis. *Lancet Infect Dis*. 2019;19:56-66.

² [Machowska A, Lundborg CS. Drivers of irrational use of antibiotics in Europe. *Int J Environ Res Public Health* 2019;16\(1\):27](#)

³ European Commission. A European one health action plan against antimicrobial resistance (AMR) [Internet]. Brussels: European Commission; 2017 [cited 29 October 2022]. Available at: [amr_2017_action-plan_0.pdf \(europa.eu\)](#)

⁴ EPI3: Etude Pharmacoépidémiologique de l'Impact de santé publique des modes de prise en charge pour 3 groupes de pathologies.

⁵ Observational studies collect and analyze data from everyday clinical practice.

⁶ Grimaldi-Bensouda, L.; Begaud, B.; Rossignol, M.; Avouac, B.; Lert, F.; Rouillon, F.; Bénichou, J.; Massol, J.; Duru, G.; Magnier, A.M.; et al. Management of upper respiratory tract infections by different medical practices, including homeopathy, and consumption of antibiotics in primary care: the EPI3 cohort study in France 2007-2008. *PLoS One* 2014;9: e89990.

⁷ Colas A, Danno K, Tabar C, Ehreth J, Duru G. Economic impact of homeopathic practice in general medicine in France. *Health Economics Review* 2015;5:18.

⁸ Moride Y. Methodological considerations in the assessment of effectiveness of homeopathic care: a critical review of the EPI3 study. *Homeopathy* 2022;111(2):147-151.

⁹ Pannek J, Pannek-Rademacher S, Wöllner J. Treatment of complicated urinary tract infections in individuals with chronic neurogenic lower urinary tract dysfunction: are antibiotics mandatory? *Urol Int* 2018;100:434-439.

¹⁰ Camerlink I, Ellinger L, Bakker EJ, Lantinga EA. Homeopathy as replacement to antibiotics in the case of *Escherichia coli* diarrhoea in neonatal piglets. *Homeopathy* 2010;99:57-62.

¹¹ Cochrane is an international organization committed to ensuring that decisions on health issues worldwide are based on high quality, relevant and up-to-date scientific evidence.

¹² Mathie RT, Clausen J. Veterinary homeopathy: systematic review of medical conditions studied by randomised placebo-controlled trials. *VetRecord* 2014;175(15):373-381.

¹³ OR: Odds ratio compares the relative odds (likelihood) of the occurrence of a particular outcome (here consumption of antibiotics or of antipyretics / anti-inflammatory drugs) when exposed to variable of interest (here: homeopathy). $OR < 1$ in this study means that the use of homeopathy is associated with lower odds of antibiotics or antipyretics / anti-inflammatory drugs consumption.

¹⁴ The 95% confidence interval (CI) estimates the precision of the OR.

¹⁵ Confounder is a factor which may influence a result. Adjustment for confounding is a statistical method to minimize this effect.

¹⁶ In case of a febrile UTI or if symptoms did not resolve after 5 days, antibiotic treatment was mandatory.

¹⁷ A homeopathic medicine made from *Escherichia coli* bacteria