Homoeopathy — an alternative kind of medicine

Contents: Data analysis and discussion concerning the nature and effectiveness of homoeopathy.

Time: 1 to 2 periods, depending on amount of discussion.

Intended use: GCSE Biology, Human Biology and Integrated Science. Links with work on treatment of disease.

Aims:

- To complement work on the treatment of disease

- To develop awareness of an important form of alternative medicine

- To develop awareness of the methods used in medical research, and the frequently uncertain nature of its findings, and to show that science does not necessarily have all the answers

- To provide opportunities to practise skills in data analysis, and to encourage willingness to enter discussion.

Requirements: Students' worksheets No. 509

This unit needs to be used carefully, and it is important to avoid condemning out of hand what is an important therapeutic regime for millions of people around the world. In this country homoeopathic treatment is available under the National Health Service and there are five National Health homoeopathic hospitals. (See 'Notes on discussion points' below.)

The data is taken from an article by Shipley et al. (1983) *Lancet,* I,97.

Notes on some of the questions

Q.1 Orthodox medicines are usually designed to have the opposite effects to those of the illness (allopathy). Some homoeopathic-type remedies do exist, for example, vaccinations and the use of X-rays to treat cancer. Orthodox medicines are usually given in regular doses and in relatively large amounts. With suitable classes the question of dilution could be taken further and put on a quantitative basis, using for example the question below.

> *How many molecules are left?*
>
> Suppose a few grams of a medicine are dissolved in water. This might contain around 0.01 mole of the medicine. Let us consider the situation when 0.01 mole is dissolved in 1 litre of water.
>
> (a) Suppose this solution is diluted a million times.
>
> > (i) How many moles are there now per litre?
> >
> > (ii) How many molecules are there now per litre?
> > (1 mole contains 6×10^{23} molecules)
> >
> > (iii) Suppose a dose of the medicine is 5cm³.
> > How many molecules are there per dose?
>
> (b) Suppose the original solution was diluted a million million million million million times. How many molecules are there now per dose?

Answers:

(a) (i) $0.01 \times 10^{-6} = 10^{-8}$ mol/litre

(ii) $10^{-8} \times 6 \times 10^{23} = 6 \times 10^{15}$ molecules/litre

(iii) $6 \times 10^{15} \times 5/1000 = 3 \times 10^{13}$ molecules

(b) $0.01 \times 10^{-30} \times 6 \times 10^{23} \times 5/1000 = 3 \times 10^{-11}$ molecules, i.e. no molecules left at all.

Dilutions of 1 in 10^{30} (as in part (b) of the question) are common in homoeopathy, and 1 in 10^{200} is not uncommon. In neither case can there be a molecule of the original drug left. 'Dynamization' cannot be explained on current scientific lines and the extent to which this is stressed tends to separate 'scientific' homoeopaths using lower dilutions, for example 1 in 10^{6}, from the more 'metaphysical' ones who would say that 1 in 10^{200} is not only very potent but potentially dangerous.

Qs 2 to 4 It appears that fenoprofen has an effect while placebo and Rhus tox. do not, but there is too much overlap to tell by eye. Statistical tests are needed. t-tests show that the effect of fenoprofen is significant while Rhus tox. is the same as placebo.

A t-test is used to tell whether or not the distribution of results using one treatment is significantly different from the distribution of results using another treatment. In particular it can be used to show that the mean of one set of results is significantly different from the mean of another set when, as in this experiment, it is not clear by eye. In this study, most of the differences between fenoprofen and Rhus tox. were significant at the 0.001 level, meaning that there is less than a 1 per cent chance in each case that the difference is due to chance variation. Differences between placebo and Rhus tox. were not significant.

Notes on the discussion points

In fact these results do not disprove the validity of homoeopathy at all. Since homoeopathic remedies are meant to be tailored to an individual and are sometimes given in single doses (regular doses were given in this experiment because it was a blind study) it can be argued that they would not be expected to work anyway. It can also be argued that blind studies are inappropriate for homoeopathy. Stress the difficulty of drawing firm conclusions from research, particularly in an area like this.

In any case, in these tests homoeopathy was used in the general context of conventional medicine. In the homoeopathic context of treating the whole person, patients may be encouraged to be more involved in their treatment, to consider their disease in relation perhaps to their personality and attitudes, in a way which may aid recovery. It is worth noting that this 'holistic' approach to treatment is gaining ground in some areas of conventional medicine. Examples are to be found in the treatment of diseases thought to be stress related (for example, heart disease) and diseases which are also social problems (for example, drug dependence and alcoholism).

It seems likely that there is more to homoeopathy than a simple placebo effect or the fact that most people tend to get better anyway. Those using the medicines claim that they are highly specific. An explanation in terms of current molecular pharmacology is not possible.

Further reading

A good reference for further details on this subject is *The Two Faces of Homoeopathy* by A. Campbell (Robert Hale, 1984).

HOMOEOPATHY — AN ALTERNATIVE KIND OF MEDICINE

What do you do if you are suddenly taken ill with stomach pains or bruise yourself badly? The chances are that you go to your ordinary doctor and take one of the modern medicines available to you. But you might go to a homoeopath — someone who practises homoeopathy.

What is homoeopathy?

Homoeopathy is a form of 'alternative' medicine used by millions of people around the world. In this country, homoeopathic treatment is available under the National Health Service.

Homoeopathy was started nearly 200 years ago by a German doctor called Samuel Hahnemann.

Like cures like

The basic principle of homoeopathy is in treating like with like.

The idea is that symptoms are the body's way of fighting disease, not the disease's way of fighting the body. The homoeopathic doctor gives the patient a medicine which would produce the same symptoms in a healthy person. The idea is to help the body's defence system.

Vaccination uses much the same idea of treating like with like. But most ordinary medicines are designed to have the *opposite* effects to those of the disease. Many ordinary doctors see no reason why like should cure like every time.

Figure 1   A field of Arnica Montana. *Arnica is a common homoeopathic medicine. Arnica ointment is used to treat bruising.*

The micro dose

Homoeopathic medicines are given in very small doses and sometimes in a single dose. They are prepared by diluting the original substance many times over. Between each dilution the mixture is shaken violently. This shaking is done to 'dynamize' the substance and make it more powerful. A common dilution is one in a million. This is one part of the substance per million parts of water. The more it is diluted, the more powerful it is considered to be. Dilutions of one in a million million million million million or even more may sometimes be used.

Many ordinary doctors cannot understand why diluting the substance millions and millions of times makes it more, not less, powerful. They would say that in some dilutions no trace of the medicine can remain. In ordinary medicine relatively large doses are given. The dose may be *increased* for greater effect.

Treating the person not the disease

In homoeopathic treatment the whole person is considered. The nature of the patient, physical and mental, influence the choice of medicine. Two patients with the same symptoms may need different prescriptions. And the prescription may also vary according to the mental state of the patient.

Answer Question 1.

Testing medicines

Scientists test all new medicines to see if they work. The basic method is to give the medicine to a group of patients and to see if, on average, they get better.

In practice it is not quite that simple. In countless experiments it has been found that just pretending to give a medicine will do some good. Sometimes patients are given something which *looks* just like the real medicine, but is really harmless and inactive. These 'dummy medicines' are called **placebos**. Patients given placebos usually feel some improvement even though the placebo is inactive. To carry out a full test of a medicine, two groups of patients are used. One group is given the placebo and the other is given the real medicine. The patients must not know which group they are in.

Testing a homoeopathic medicine for arthritis

Arthritis is a disease of elderly people. It can cause severe pain in the joints. An experiment was carried out to compare a homoeopathic medicine with an ordinary medicine for the treatment of a form of arthritis. The homoeopathic medicine was prepared from the poison ivy Rhus tox. The ordinary medicine was called fenoprofen.

Question

1 What are the main differences between homoeopathy and ordinary medicine?

Figure 2   Hands affected by arthritis

In each case the patients were asked how much pain they felt. They were asked this before the treatment, and after a two-week course of treatment. The patients were asked to rate the pain they felt on a 0 to 5 scale. A higher pain score means more pain.

The pain scores for all the patients in a group were added up and averaged. The averages are shown in Table 1. The table also shows the amount of variation from the average. For example, a pain score of 2.30 ± 0.88 means that the average score was 2.3 and that about 70 per cent of the scores ranged up to 0.88 more or 0.88 less than the average. Obviously the pain that people feel differs from one person to the next.

There were three groups of patients:

Group 1 were given the inactive placebo
Group 2 were given the homoeopathic medicine Rhus tox
Group 3 were given the medicine fenoprofen.

All the patients were also allowed to take paracetamol tablets for pain relief if they wanted. At the end of the experiment they returned the paracetamol tablets they had not used.

The results of the experiment are shown in Table 1. Study the table carefully, then answer questions 2 to 4.

> *Questions*
>
> 2   *What does the experiment suggest about the usefulness of Rhus tox. and fenoprofen in treating arthritis?*
>
> 3   *What difficulties did you have trying to draw conclusions from the figures?*
>
> 4   *What in particular does the number of returned paracetamol tablets tell you?*

Table 1   Results of the experiment to compare a homoeopathic medicine and an ordinary medicine

	Pain before treatment — all groups	Pain after treatment Group 1 Placebo	Group 2 Rhus tox.	Group 3 Fenoprofen
Pain on movement	2.09 ± 0.72	2.30 ± 0.88	2.27 ± 0.63	1.70 ± 0.85
Pain at rest	1.45 ± 0.90	1.64 ± 0.96	1.58 ± 0.87	1.18 ± 0.82
Night pain	1.55 ± 1.0	1.91 ± 0.95	1.91 ± 0.80	1.27 ± 1.04
Paracetamol — number of tablets returned		61.8 ± 30.1	59.0 ± 33.0	70.1 ± 30.6

More points for discussion

- From the evidence of this experiment can you draw a general conclusion about whether homoeopathic medicines work?

- Did the experiment provide a normal situation for homoeopathic treatment?

- Do you have to believe in homoeopathy for it to work? Do you think 'believing in' any medical treatment helps in recovery?

- How could you set up an experiment to test your answer to the last point? What would be the problems?

- Many people use homoeopathic medicines and find that they do work. How might they work?

- Do you think that homoeopathic medicines would work on animals?