Belief: an amazing healing device

Ray Sturgess reviews the evidence for the key role that patients' beliefs have in the healing process. He argues that belief is the sole explanation for the effectiveness of many complementary therapies and suggests improvements to how pharmacists deal with supplying complementary medicines

Belief heals. This is just as well because until relatively recently belief in their dubious skills was all that doctors had to offer. It is easy now to forget that the era of effective drugs came in only 60 years ago. Before that, there was only digitalis for heart incompetence, mercury compounds for syphilis and the two wonder drugs, opium and aspirin.

As the number of efficacious drugs has increased, the importance of belief in medicine has become overlooked. Reliance on drugs has meant that the traditional courtesies of the medical profession (the giving of time and attention to patients and the cultivation of a bedside manner) have gone by the board. As the eminent physician, Sir Theodore Fox, put it: "Lack of time made us all bad doctors".[1]

The result has been a boom in complementary medicines and therapies, whose practitioners are prepared to give the patient the attention so often no longer available in NHS surgeries. Homoeopathy, acupuncture, reflexology and the rest flourish — figures released last year show that aromatherapy centres are the fastest growing businesses on the high street. Pharmacists, half a century ago only too keen to give up their embarrassing involvement with compounding mixtures containing tincture of asafoetida and infusion of quassia, now have remedies just as arcane back on their shelves . Black cohosh jostles for shelf space with pleurisy root and diluted-to-infinity homoeopathic preparations. And it is awful to contemplate that there are probably pharmacists out there selling bits of mineral rock declared to be "healing crystals".

Scientists are, understandably, appalled. But the fact is that millions of people obtain relief from a variety of distressing conditions by resorting to complementary medicines and therapies. Sceptics who say that the treatments simply work by suggestion, as if that negates their benefits, miss the point. It is futile to tell a person who has obtained relief from his or her back pain by taking a homoeopathic preparation of hocus-pocus that homoeopathy is not scientifically proven. Science is about observation and the science-is-all brigade need to acknowledge that in some conditions, for some individuals, complementary medicines are effective. Alternative remedies are here to stay and, as Edzard Ernst observed recently, the public's love affair with complementary medicines should be channelled wisely.[2] Professor Ernst says that pharmacists are the obvious candidates to offer advice in this area but, unfortunately, their training and experience, with a few exceptions, does not qualify them to do so. To offer advice on complementary medicines, it is first of all necessary to know how they work.

David Parker / SPL

To understand the action of complementary medicines it would be helpful to recall a classic study in a factory in Holland just after the 1939–45 war. In Europe in the late 1940s most factories had been damaged or destroyed during the war, or had been turned over to armaments manufacture. The Americans stepped in with the Marshall Plan to help revive industrial production. A key element was to increase productivity over pre-war levels by the use of the latest management techniques, and a work study team went into the Philips factory at Eindhoven. The team went into one of the production bays, talked to the workers and boosted the overhead lighting in the bay. Production went up by 30 per cent. As a result, the management increased the lighting throughout the factory. However, production increased only by one or two per cent. After giving the matter some thought, one of the team talked to the workers in the original production bay and lowered the overhead lighting to a level below the original illumination. Production went up by a further 20 per cent. It was realised that the cause of the increased production was not the lighting. On both occasions the workers felt that somebody was taking an interest in them and were prepared to work harder.

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Placebo effect is a misnomer

Doctors have always had hypochondriac patients they wanted to see the back of, and giving them coloured water or bread pills was an easy way of keeping them away from the surgery for a week or two. The use of the term "placebo", the Latin word for "I will please", for fake medicines came into being in the late 18th century. The Oxford English Dictionary dates the first known use of the word in the medical sense at 1785. Previously, the word was used to indicate insincere words, a meaning that arose from the mysterious inclusion of *placebo* in the Latin version of a psalm used in the Middle Ages in the vespers for the dead. The deceased's loved ones had to pay handsomely to have the psalm read and, because money rather than sincerity appeared to be the Church's motivation, placebo came to stand for insincere words that, nevertheless, gave the recipient consolation. It was only a small step to apply the term to medicines that were fake but comforting.

People who participate in clinical trials and benefit from the so-called placebo effect do so because, like the Philips workers, they feel that they are receiving special attention. The term "placebo effect", however, is misleading because the benefits effected are primarily due not to the dummy medicine being administered but to the supportive conditions under which the fake treatment is being administered.[3] I therefore prefer to use the term "belief response" for the mechanism that produces benefits when a placebo is taken or when assurance (solicitude shown to patients) is given, or both.

Potency of placebos

If people are prepared to work harder just because someone gives them a little consideration, it is not surprising that a sufferer wanting to be relieved of an unpleasant symptom will respond to a therapist offering them time and attention as well as giving them some diluted potion, sticking needles into their skin or massaging their toes. But before the complementary therapists throw up their hands in horror at the idea that belief is the sole means by which their treatments work, they would do well to consider the force they are disowning.

The original justification for giving a neurotic patient some useless medicament was that because the illness was imaginary, the cure could be also. The realisation that fake medicines could relieve genuine maladies came relatively recently. Credit for this discovery is generally given to Henry Beecher, who first publicised the curative properties of placebos, although this effect had been known in medical and nursing circles for some time. For example, in hospitals in the UK in the 1930s it was common practice for the ward night sister to give restless patients an intramuscular injection of sterile saline solution to settle them down for the night (personal communication).

Beecher discovered the potency of placebos in the setting where many medical breakthroughs have been made: on the battlefield. Beecher was an anaesthetist in the American army and, during the closing stages of the 1939–45 war, his medical unit frequently ran out of morphine. Faced, on one occasion, with treating a soldier with horrific injuries and without morphine to relieve the pain, Beecher was surprised when a nurse injected the patient with saline. He was even more surprised when the injured soldier responded as if he had been given morphine and went through the subsequent operation with only mild discomfort. To Beecher's amazement, the patient also failed to exhibit the usual post-operative surgical shock.

Adam Gault / SPL

Injured soldiers responded to saline injections

Beecher was so impressed by this wartime experience that after the war he assembled a team at Harvard to study the effects of suggestion or "the placebo effect". The outcome was the publication in 1955 of his now famous — some would say infamous — paper, "The powerful placebo".[4] Beecher's publication, being the first on placebos, is still cited in spite of its findings having since been questioned and criticised to the point of demolition.

The main objection to Beecher's studies is that he did not compare his groups of patients receiving placebos with groups receiving no treatment, and that the improvements he attributed to placebos could have been simply due to spontaneous remission or normal fluctuations in the severity of symptoms.[5] The irony is that Beecher went on to champion the placebo-controlled clinical trial, arguing, rightly, that judging the efficacy of a new drug on the say-so of an eminent physician (the method up to that time) was useless because any observed improvements must be compared with a group receiving a placebo. Beecher, for all his faults, at least recognised that benefits would be observed in patients receiving a new drug, regardless of its effectiveness, from an authority figure, and all the more so if he was silver haired and wore a white coat.

The idea of comparing new drugs with placebos had been mooted before Beecher published his paper, but all new ideas are ignored or rejected until their time is ripe — Copernicus argued that the planets of the solar system revolve around the sun almost a century before Galileo did. What Beecher did do, along with Harry Gold, who had led a conference on placebos at Cornell University as early as 1946, was to overcome the antagonism to the idea, which was based on the argument that it was unethical to withhold treatment from ill and vulnerable subjects. By the late 1950s, Beecher and Gold had largely succeeded in convincing the medical profession that placebo groups were essential as controls.

The power of belief

What continues to surprise observers of clinical trials is the apparent effectiveness of placebos. In his original paper, Beecher reviewed 15 placebo controlled trials and concluded that 35 per cent of those given placebos responded positively, and the notion that a third of the population were likely to experience the belief response (although then still called the placebo effect) became the general view. Evidence now suggests that all individuals, given the right conditions, are capable of responding to a placebo.[6] However, the extent of the response varies. In the most striking instances, the placebo recipients experience complete relief of their symptoms or at least relief as good as that achieved in those taking the comparison drug.

Observers have been even more surprised by the results obtained with placebo surgery, which are consistently as effective as real operations. The first published evidence that dummy surgical procedures could produce a belief response appeared in the late 1950s when surgeons carrying out a procedure that involved tying off clogged coronary arteries to relieve angina decided to try placebo operations. These involved cutting the chest, exposing the heart and arteries but not ligating them. The surgeons found that those given the fake operation showed about the same level of reduction in angina pain as those undergoing the real operation.[7] The idea behind tying off coronary arteries was that new arteries would sprout to compensate for the reduced blood supply, effecting spontaneous bypasses. In fact, no such regeneration of new arteries was ever observed and that, coupled with the belief response exhibited with dummy operations, led to the abandonment of this unnecessary operation.

Equally impressive were the results from giving patients dummy ultrasound for post-operative dental pain. Patients, following tooth extraction, had their jaws massaged with the ultrasound applicator. Unknown to the dentists applying the device, the machine was inactive when half the patients were treated. Ultrasound, by definition, is inaudible to the human ear and there was no way the operators or the patients knew whether or not the machine was producing ultrasound. Not only did the patients receiving no ultrasound get as much relief as those who did, but the relief was greater than when the ultrasound was given at higher levels.[8] Similar results have been obtained with arthroscopy, a procedure that involves internally scraping and rinsing out the knee joint — no apparent difference between those receiving a dummy operation and those undergoing a real operation was observed after six months.[9]

What is clear from the wealth of evidence is that there is an innate desire in sufferers to believe that they are about to be cured or relieved of their symptoms. For most individuals the minimum assurance is needed, as when the production workers were listened to about their working conditions, or when patients participate in a clinical trial even though they know that they are as likely as not to be given a dummy drug. This strongly suggests an instinctive awareness in individuals that, in the hands of those seen as author-

itative and who can give assurance, they have an in-built healing response. The response is physiological and not, as previously thought, all in the mind. Researchers at the University of British Columbia used positron emission tomography to estimate dopamine activity in patients with Parkinson's disease and injected apomorphine or saline as a placebo. They found that the brains of patients given saline released dopamine, achieving the same effect as the dopamine agonist.[10] It seems that the body is able to decide precisely what physiological response is needed, as when endorphins are released in response to a placebo such as saline injection.[11] More research on the biochemical response to placebos and to assurance tokens like doctors in white coats, is needed but it is clear that the belief response is potent and readily triggered.

Homoeopathy

We need look no further than the belief response to explain the benefits of complementary medicines. Homoeopaths invest a lot of time and effort trying to master Samuel Hahnemann's theories. To impress those who are susceptible to such things, homoeopathy was dressed up with an impressive hypothesis and given a Latin tag, *similes similibus curentur*: "let like be cured by like." Hahnemann put into his armamentarium many esoteric herbs like may apple and poison ivy, hallowed from an age when herbal medicines were practically the only medicines available to most people.

Hahnemann was lucky with his timing. When he launched homoeopathy, doctors were busily purging and bleeding their patient (sometimes to death), and any alternative to the blood-and-guts approach would have appealed. Homoeopathy has continued to be lucky. The revelation that members of the royal family are homoeopathy fans must have recruited many more followers. However, the fact is that homoeopathic preparations have consistently failed to produce results better than those achieved by placebos and the most likely explanation of the benefits reported by those resorting to such ultra-dilute tinctures is the harnessing of the belief response.

Complementary medicine and pharmacy

Before we dismiss homoeopathy (and this applies equally to acupuncture, reflexology and other alternative therapies) as merely being a complicated way of inducing the belief response, we have to consider the possibility that the belief response of some individuals, perhaps those in whom the response is not so easily triggered, can only be induced by offering them a system of impressive complexity. It is because of this possibility that we, although members of a science-based profession, need at present to give complementary medicines the benefit of the doubt.

The one area where complementary medicines score over conventional drugs is in their safety, and this alone is likely to ensure their popularity for the foreseeable future. Conventional drugs are still at the blunderbuss stage — aimed at a specific biochemical function but also hitting areas outside the target. For example, between 10 and 20 per cent of peptic ulcers are caused by non-steroidal anti-inflammatory drugs. In the US, the cost of the hospital treatment of iatrogenic disease caused by prescription drugs is over $100bn annually, and the annual number of deaths due to mistakes with treatment or medication is estimated at 120,000.[14] On these considerations alone, complementary medicines deserve their place in the sphere of self-treatment.

The recent involvement of pharmacists with complementary therapies has been for the same reason that always prompts innovations in retail trading: making money. Given that the profit motive can be viewed as responding to public demand, there can be no objection to community pharmacists selling complementary medicines, providing that they are well informed on the products they supply. But, at the moment, this is too often not the case. Schools of pharmacy are not required to include complementary medicine in their curricula, and most pharmacists do not have the time or inclination to include this field in their continuing professional development. It does not help that the section on complementary medicines in the Royal Pharmaceutical Society's Code of Ethics and Standards, although well intentioned, is, to say the least, imprecise. It states: "Pharmacists providing homoeopathic or herbal medicines or other complementary therapies have a professional responsibility:

(a) To ensure that stocks of homoeopathic or herbal medicines or other complementary therapies are obtained from a reputable source of supply;
(b) Not to recommend any remedy where they have reason to doubt its safety or quality;
(c) Only to offer advice on homoeopathic or herbal medicines or other complementary therapies or medicines if they have undertaken suitable training or have specialised knowledge."

The wording of (a) is harmless enough, although it is difficult to define "reputable". No clue is given as to whether it should be individual pharmacists who decide which suppliers are reputable or, say, the Society's inspectors. The wording of (b) is, to put it mildly, bizarre. A pharmacist may not recommend a product whose safety or quality is in doubt, but there is nothing, apparently, to prevent him or her selling dubious remedies. Finally, the aim of (c) is worthy enough, although who decides who has had suitable training or acquired specialised knowledge is unclear.

Herbal medicines need to be considered separately from the other alternative treatments because there is plenty of evidence of the effectiveness of several herbal preparations. My view is that only those herbal medicines that have been shown to be effective should be stocked in pharmacies and the rest left to health stores. Professor Ernst's department of complementary medicine at the Peninsula Medical School has a wealth of information on the effectiveness, or otherwise, of most of the commonly used herbal medicines[15] and this could be used as the basis for compiling an approved list for pharmacies.

When schools of pharmacy have incorporated the teaching of the mechanism of the placebos and the belief response and their relevance to the complementary medicines in their curricula, the profession will have taken the first step towards ensuring that pharmacists become the best advisers on complementary medicines available. A more immediate need is for the revision of the relevant section of the Code of Ethics relating to complementary medicines. A desirable additional move would be for the Society's Council to appoint a body to compile a list of effective herbal medicines approved for sale in pharmacies.

Further reading

- Evans D. Placebo. London: Harper Collins; 2003.This book is the most comprehensive survey of placebos and the so-called placebo effect.
- An alternative, giving wide coverage of the subject, is the paper Papakostos YG, Daras MD. Placebos, placebo effect and the response to the healing situation: the evolution of a concept. Epilepsia 2001;42:1614–25.

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