Migraine Headaches and the Remarkable Power of Placebos

A new study finds that the placebo effect is just as powerful as a popular pill in treating migraines. How can doctors use that to help us feel better?

By Joseph Stromberg
January 8, 2014

It's one of our most powerful medical treatments, and certainly our most widely-effective. In recent years, it's been found to help treat or reduce the symptoms of clinical depression, irritable bowel syndrome, panic attacks, coughing, ADHD, restless leg syndrome and erectile dysfunction, among other conditions.

Related Content

- Why Do Placebos Work?
- What Is the Nocebo Effect?
- Sugar Placebo Pills Can Make You Feel Worse

The latest study to demonstrate its remarkable effectiveness was published today in *Science Translational Medicine*. In it, the treatment was administered to people who chronically suffer from migraine headaches and found to be just as effective as rizatriptan, one of the most widely-used migraine drugs.

This name of this wonderful treatment? It's the placebo effect, the remarkable power of the human brain to unconsciously influence the functioning and perception of the body.

The term was first used sometime during the 1700s (it's Latin for "I shall please"), but the concept itself dates back centuries. Historically, doctors believed that one of their key duties, in addition to curing a patient, was to console him or her, providing a morale boost that could help them to get better faster—sometimes in the form of a dummy medicine that had no effect beyond instilling the expectation of improvement in the patient's brain.

It's now widely recognized that, while largely ineffective in improving objective symptoms (like high blood pressure or an infection, for instance), placebos are genuinely effective in treating subjective, self-reported symptoms, including all sorts of pain. Placebos can take all sorts of forms: inert sugar pills, sham surgeries and saline injections.

Of course, none of this implies that people who report relief from a placebo are "faking" their conditions or pain—far from it. They, like all of us, are simply subject to the same surprising mechanisms that allow our brain's expectations to alter how we perceive our body and health.

The singular power of expectations has been demonstrated in a variety of studies. In one, for example, patients given a placebo pill that's referred to as a muscle relaxer will experience muscle relaxation, while those given a placebo called a muscle stimulator will experience muscle tension. (The flip side of the placebo, the nocebo effect, is just as powerful—negative expectations can cause as much harm as positive ones can do good.) In others, it's been shown that red, yellow or orange placebo pills are more likely to provide a simulating effect, while blue and green are more often perceived as sedating. One study even found that bigger pills are better when it comes to placebo performance.

The neuroscience that underlies all of these studies—and links expectations, based on pill size or color, to perception of pain and other sensations—isn't well understood at this point. Scientists have conducted some imaging research into the brain on placebo, and they've found that ingestion of a placebo billed as a painkiller leads to increased activity in several areas of the cerebral cortex, as compared to an actual painkiller. These areas are involved in so-called "higher" functions like memory, attention, thought and consciousness. A pain-killing placebo, it seems, works differently than a painkiller.

In the new headache study, conducted by researchers at Harvard Medical School, 66 participants who chronically suffer from migraines were given six envelopes, each containing a pill to be taken after their next migraine attack. Two envelopes were labeled "Maxalt" (the brand name for the rizatriptan migraine drug) in order to generate positive expectations, while two had no label, to produce neutral expectations, and two were labeled "placebo," to generate negative expectations.

But for each of the three labels, one envelope held a genuine rizatriptan pill, and one contained a placebo. This allowed the researchers to cross-compare the effectiveness of rizatriptan + positive expectations, rizatriptan alone, and rizatriptan + negative expectations, as well as positive, neutral and negative expectations in isolation.

When the scientists analyzed the participants' self-reported pain reductions after taking the pills, the power of the placebo was proven yet again. People who'd taken a placebo pill labeled Maxalt got just as much pain relief as those who'd taken a Maxalt pill labeled as a placebo. Additionally, people who took a Maxalt correctly labeled as Maxalt reported about twice as much pain reduction as those who took a Maxalt pill labeled as placebo. In other words, in treating a complex, chronic form of pain like migraine, the effectiveness of pure expectations was roughly equal to the effectiveness of the pharmaceutical itself.

What's the lesson of all this? Not that the placebo is a dishonest trick, a flaw in the way we perceive medical treatments, but that it could be a remarkably powerful tool for doctors to use in legitimately treating their patients—and one that's relatively untapped, in many areas.

For a doctor, harnessing the placebo's power doesn't mean intentionally mislabeling pills. Instead, a doctor could simply provide a slightly more positive message about a treatment,

lending the power of expectations to that of pharmaceuticals. "When doctors set patients' expectations high, Maxalt becomes more effective," lead author Rami Burstein said in a press statement. Because the converse, unfortunately, is also true—studies on the nocebo effect have shown that repeated warnings about medications' side-effects can lead to increased perception of side-effects—it might also be worthwhile for doctors to avoid excessively dwelling on side-effects before they occur.

Of course, this sort of intentional expectation-setting needs to be done carefully. Doctors have an ethical obligation not to mislead patients or withhold important information.

But that doesn't mean that making sure to provide subtle positive cues about the effectiveness of a medication—especially when those very cues might well make it work more effectively—is a bad idea. As Ted Kaptchuk, one of the study's co-authors, put it, "the placebo effect is an unacknowledged partner for powerful medications."