

Effects of the placebo effect on the brain



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This research paper attempts to explore the mechanism of Placebo effect and how it affects the brain. Starting with a detailed introduction to the Placebo Effect, touching the background of Placebo technique lightly, the paper will review some available, relevant theories and research literature on the topic and will conclude with a summary of the research review findings, in relation with the theoretical explanations available for the process of placebo. This paper is basically an attempt to find out how placebo effect works and how the brain reacts to a placebo to make it successful.

Introduction

Placebo treatment is also known as 'sham' treatment in the world of medicine. Fake pills, sugar or bread pills, saline injections and other harmless substances are administered to restless patients, while keeping them in dark about the reality of treatment, to sooth them and make believe that they are being given some extensive, suitable medical treatment which will ensure cure in them. This treatment is known to have positive effects on many types of patients and it actually psychologically helps in curing the patients (Harrington, 1997)

Placebo effect is effective form of treatment in many cases, specifically depression, anxiety, headaches, migraine and Parkinson disease.

Placebo Effect

According to Shapiro (1968) cited in Harrington (1997), placebo is defined as any sort of therapy, administered knowingly or unknowingly by a practitioner or layman in order to heal a medical condition while it actually has no direct

therapeutic effect. A placebo is any treatment that is intended to improve the general condition of the patient but has no physical or chemical impact directly on the condition. Placebo effect is therefore defined as:

‘ The non specific psychological or psycho physiological therapeutic effect produced by a placebo or the effect of spontaneous improvement attributed to the placebo treatment’ (Shapiro, 1968, cited in Harrington, 1997).

As per Cavanna and colleagues (2007), a placebo effect can be defined and explained as a healing reaction induced by non specified verbal or behavioral actions, which work via the patient’s belief in treatment. Placebo effects work through a variety of pathological conditions thus enabling the scientists to understand and study quite a lot of interaction occurring between the mind, brain and the body (Cavanna, 2007).

History of Placebo Effect

‘ Placebo’ is an italic word meaning ‘ I shall please’. This term was first used in the eighteenth century, in the world of medicine and meant a treatment the purpose of which was to please the patient instead of having a medical therapeutic effect (Cavanna, 2007). According to Harrington (1997), the word ‘ Placebo’ is also found in the opening lines of the Catholic Vespers for the Dead.

In earlier times, the only placebo thought of and administered was a sugar pill. But nowadays placebos can include many types of harmless treatments, injections, drugs and even sham surgeries.

The placebo effect shares the mechanism of faith healing. It causes cure via faith- the belief that the person now has the power to heal.

The Neurology of Placebo Effect

The belief of going through a medical treatment often causes changes in brain neurotransmitters that are remarkably similar to those changes which occur due to real medicines (Fowler, 2010). According to Fernandez and colleagues (2006), a neuro transmitter Dopamine is known to release with placebo treatments in Parkinson disease. This neurotransmitter is also known to play a role in the brain's reward mechanism. There is growing evidence that release of Dopamine causes the healing effect in the patients undergoing placebo treatments.

2. 1 Perception of Placebo effect by the Brain

According to Fowler (2010), when humans take a medicine or go through a treatment, their belief system is of utmost importance in the process of healing. The more one believes in the medicine, the more quickly it produces healing. For instance, when we take a pain placebo treatment, the brain stops (or reduces) sending pain signals to the body which in turn stops experiencing pain. The brain actually perceives the placebo as a treatment and starts giving signals of being healed to the body, which is wired to act according to those signals- the process therefore results in producing healing effects.

Literature Review

A research was conducted by Patterson (2002), to investigate the placebo mechanism among patients of depression. The results regarding the

patient's belief system were surprising. The subjects were divided into 2 groups. One group was administered placebo and the other; antidepressants. The brain studies revealed that the activity in the right hemisphere of the placebo group had increased while in those having the antidepressants had decreased. However, both groups reported an equal amount of depressive symptoms reduction. They study further found that healing effects in some of the placebo patients were not lasting. The researchers conclude that placebo is effective in treating mild depression but chronic depressives do need real treatment for reduce the depression long term.

According to Friedman and Dubinsky (2008), after review of many studies on placebo effects, Goetz and colleagues (2008) concluded that placebos cause similar brain activity to the one caused by original medicine. In one study for example, where the medicine intended to increase dopamine level in the brain, the placebo did the same and had similar healing effects. Other studies reviewed regarding depression and Parkinson disease also showed similar brain activity via PET scans in both the control group and the treatment group.

In one study, Zubieta (2005) found that the pain patients who were being given a placebo produced higher levels of endorphins, which are the actual, natural pain killing elements produced by the brain. This study clearly shows that placebos have the power of inducing healing actions in the brain and body.

In another pain related placebo study, Benedetti and colleagues (2005) found that the expectation of pain reduction is an important factor in release

of pain reducing hormones by the brain. The findings of this study were also consistent with the notion that the endogenous Opioid system (Placebo responding regions of the brain) is an important component of the interactive neurological connection between the brain and body.

All the above reviewed research findings suggest that placebo effects bring about changes in the brain's level of neurotransmitters, especially Dopamine. This change may or may not be the same as original treatment but the effect on healing of both is usually similar.

3. 1 Some ethical Considerations in use of Placebo

There has recently been a lot of controversy as far as usage of placebos is concerned. Some scientists suggest that this falls in the category of deception while others suggest that this is an unethical practice in a way that the patients are unknowingly given placebos when better, tested and reliable alternative true medicines are available. Giving a placebo may produce only temporary symptoms of healing and the patients might be subjected to a delayed proper treatment for the disease.

According to Freidman (2008), all placebo studies must attempt their best to make sure that no patient in the end of the study is left deprived of the real treatment and that the placebos offer have virtually no negative side effects on the patients.

Summary

The mechanism of placebo can therefore be summarized as follows:

The patients are deceived.

They expect a cure or some sort of pain reduction.

They benefit from the expectation and their brain starts behaving like it does in case of real treatment.

The body gets healing signals and reacts accordingly.

This healing affect may or may not be permanent depending on the intensity of disease and varying from person to person.

The placebo effect is therefore an expectation effect. Which means that the brain will react and behave on the lines of something that it is expecting will occur (Fowler, 2010). Placebo techniques are being successfully used in current medical world in many areas.