



# Hypnoanalgesia: A Bridge Between Neuroscience and Clinical Settings

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## Dear Editor,

Historically, hypnosis has been widely applied for clinical purposes. For instance, we can mention Anton Mesmer (1734 - 1815) as the father of modern hypnosis that used this technique for treatment. However, the first well-known reports on the application of hypnosis in surgery and analgesia (hypnoanalgesia) are related to James Esdaile (1808 - 1859) in India (1). Some promising results showed the brain capability to reduce pain. In this way, some neuroscientists considered hypnosis as subject of their studies. Santiago Ramón y Cajal (1852 - 1934), Nobel Prize laureate, is famous for his discovery on mechanism of neuronal morphology and connections. He published one of the first case studies on using hypnoanalgesia for childbirth (1). Cajal showed that hypnosis works, but he could not describe how hypnosis could change brain to reduce pain.

Considering the advancement in neuroimaging research in previous decades, we know that there is not a 'pain center' in the brain; in fact, pain experience is a product of complex interaction between certain brain areas (neuro matrix) and peripheral nervous system (2). Anterior cingulate cortex (ACC), insular cortex, thalamus, prefrontal cortex (PFC), primary and secondary sensory cortices are some cortical areas that most often contributes to pain experience (2). A body of neuroimaging studies indicated that hypnosis could modulate all these brain areas, and even some evidence suggested that hypnosis could have an influence on spinal mechanisms of aversive stimulation processing (2).

Neuroimaging studies give objective information that suggests hypnosis is not a simple imagination. An fMRI study by Derbyshire et al. (cited in Jensen and Patterson) compared three painful conditions with each other as follows: (1) pain induced by noxious stimulation, (2) imagination about pain, and (3) hypnotic-induced pain. Brain patterns in first (noxious stimulation) and third (hypnotic

pain) conditions were similar. This means that the fMRI results showed an overlap between some areas such as ACC, PFC, thalamus, insula, and some other areas involved in pain experience. Although the intensity of these brain activities in first condition was higher than hypnotic pain, hypnosis group had greater brain activity than imagination group (2).

Besides the great impact of neuroscience on our understanding of what hypnosis really is and how it works, recent studies showed the effectiveness of hypnoanalgesia in clinical setting. A meta-analysis on 85 experimental studies indicated that hypnoanalgesia reduced pain up to 42% (3). In addition, hypnosis can go beyond the pain reduction. Another meta-analysis on breast cancer patients undergoing minor surgery showed that along with the significant postoperative pain reduction, there were lower levels of preoperative anxiety in the patients (4).

One of the advantages of hypnosis, as a therapeutic tool is that clinicians can add it to other interventions for greater effectiveness. For example, in a study on fibromyalgia patients, researchers added hypnosis to multicomponent cognitive-behavioral therapy (CBT) and compared this group with two pharmacological treatment (standard care) and multicomponent CBT groups. After six-month follow-up, the results showed that some symptoms such as pain intensity, catastrophizing, and psychological distress significantly improved in the first group (multicomponent CBT+ hypnosis) compared to two other groups (5).

We can also consider the cost-effectiveness of this intervention. In 2007, a study on 200 breast cancer patients by Montgomery et al. (cited in Jensen and Patterson) reported that patients in the hypnosis group needed less drugs like propofol and lidocaine for sedation and analgesia. In addition, they reported less pain and reduced symptoms like nausea and fatigue. Moreover, regarding costs, an average of \$772.71 was saved per patient (2).

Hypnoanalgesia is a bridge between neuroscience research, looking for neural mechanisms underlying hypnosis, and studies suggesting the effectiveness of hypnosis in clinical settings. Further research can develop the application of hypnosis.

#### Footnotes

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