

Topical review

Hypnosis for chronic pain management: A new hope

Mark P. Jensen *

Department of Rehabilitation Medicine, Box 356490, University of Washington School of Medicine, Seattle, WA 98195-6490, USA

1. Introduction

Hypnosis can be defined as an induction followed by a suggestion (or set of suggestions). The induction usually consists of "...an extended initial suggestion for using one's imagination" [p. 262, [14]], or an invitation to focus one's attention, and is thought to make the hypnotic subject more receptive to suggestions. An induction can take several seconds or up to 10 minutes or longer, depending upon the clinician's usual practice and the hypnotic subject's response. The suggestions that follow the induction usually include "...suggestions for changes in subjective experience, alterations in perception, sensation, emotion, thought, or behavior" [p. 262, [14]]. Documented use of hypnosis for pain management extends back to the 1840s, when John Elliotson (1791–1868) reported using "mesmeric sleep" as an effective anesthetic during surgery [10].

Although hypnotic analgesia is among the oldest treatments for pain, interest in its use seems to wax and wane. Currently, interest in hypnotic treatments for chronic pain appears to be on the rise, possibly due to (1) confirmation from imaging studies that chronic pain is largely influenced by, and may at times be primarily the result of, supraspinal neurophysiological processes; (2) evidence that hypnosis has observable influences on the neurophysiological processes associated with pain; and (3) empirical confirmation that hypnotic analgesia is effective for chronic pain management. The purpose of this topical review is to provide a brief summary of the key findings in these three areas and summarize some innovative new directions in the field.

2. The experience of chronic pain is the result of complex interactions between multiple supraspinal CNS sites

Early research on the neurophysiological underpinnings of pain focused on peripheral activity emanating from the site of injury. Some of that focus shifted to the spinal cord after the introduction of the gate control theory [21]. With recent improvements in imaging technology, there has been a dramatic increase in the study of the central neurophysiological correlates of pain. As a result, we more fully understand how the experience of pain is directly associated with multiple integrative and interlocking neurophysiological mechanisms and sites, with supraspinal sites playing a key role. The supraspinal sites most commonly linked

to pain include the thalamus, the insula, the primary (S1) and secondary (S2) sensory cortices, the anterior cingulate cortex (ACC), and the prefrontal cortex [2,6]. The fact that so many CNS sites, structures, and processes contribute to pain gives the clinician a large variety of interventions to choose from, including psychological interventions that affect cortical activity, such as hypnosis [16].

3. Imaging evidence demonstrates that hypnosis has direct effects on many supraspinal sites involved in the experience of pain

Research published in the last decade demonstrates that hypnosis and hypnotic suggestions impact activity in many of the CNS sites associated with pain. One study, for example, has shown that suggestions for feeling pain in the hand in healthy and (initially) pain-free individuals resulted in both (1) reports of pain and (2) increased activity in the thalamus, ACC, insula, prefrontal, and parietal cortices [7]. This study also showed that the effects of suggestions on both pain intensity and cerebral activation were stronger when the suggestions followed a hypnotic induction than when participants were asked to simply "imagine" pain without a hypnotic induction. Research also demonstrates that it is possible to increase the intensity of pre-existing (chronic) pain with suggestions (see below) [8].

Presumably, if hypnotic suggestions can produce pain and increases in pain-related cortical activity, they might also be able to produce pain relief and decreases in activity in these same brain areas. In a follow-up study, Derbyshire and colleagues suggested to individuals with chronic pain that they would experience their clinical pain as being of "low", "medium", and "high" intensity, both following and not following a hypnotic induction [8]. Changes in pain intensity reports and pain-related brain activity occurred in both the hypnotic and nonhypnotic conditions, consistent with the suggestions. That is, suggestions for high pain resulted in increases in pain and increases in cortical activity associated with the experience of pain, whereas suggestions for low pain resulted in decreases in pain and decreases in cortical activity in these same areas. Moreover, as was shown in their earlier study [7], the suggestions had larger effects following a hypnotic induction.

Two additional studies showing changes in pain-related brain activity following hypnotic suggestions for pain relief are of particular relevance to this topical review [15,25]. In the first, Rainville and colleagues demonstrated that hypnotic suggestions for decreased and increased pain *unpleasantness* succeeded in reducing and increasing ratings of pain unpleasantness, respectively, but

* Corresponding author. Tel.: +1 206 543 3185; fax: +1 206 685 3244.
E-mail address: mjensen@u.washington.edu

