

Effect of hypnotic suggestion on fibromyalgic pain: Comparison between hypnosis and relaxation

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Abstract

The main aims of this experimental study are: (1) to compare the relative effects of analgesia suggestions and relaxation suggestions on clinical pain, and (2) to compare the relative effect of relaxation suggestions when they are presented as “hypnosis” and as “relaxation training”. Forty-five patients with fibromyalgia were randomly assigned to one of the following experimental conditions: (a) hypnosis with relaxation suggestions; (b) hypnosis with analgesia suggestions; (c) relaxation. Before and after the experimental session, the pain intensity was measured using a visual analogue scale (VAS) and the sensory and affective dimensions were measured with the McGill Pain Questionnaire. The results showed: (1) that hypnosis followed by analgesia suggestions has a greater effect on the intensity of pain and on the sensory dimension of pain than hypnosis followed by relaxation suggestions; (2) that the effect of hypnosis followed by relaxation suggestions is not greater than relaxation. We discuss the implications of the study on our understanding of the importance of suggestions used in hypnosis and of the differences and similarities between hypnotic relaxation and relaxation training.

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1. Introduction

The efficiency of methods of hypnosis at reducing pain has been well established (Hilgard and Hilgard, 1975; Barber, 1996; Syrjala and Abrams, 1996; Montgomery et al., 2000; Barber, 2001; Patterson and Jensen, 2003). Hypnosis has also proved to be effective in cognitive-behavioural interventions (Kirsch et al., 1995; Milling et al., 2003) but it has not been shown to be superior to relaxation or autogenic training in the treatment of

chronic pain (Patterson and Jensen, 2003). As far as relaxation is concerned, and despite the fact that it has proved to be effective at treating chronic pain (Arena and Blanchard, 1996; Syrjala, 2001), some studies highlight its drawbacks (Carroll and Seers, 1998; Keel et al., 1998).

Although pain is a multidimensional experience, it is usually expressed in terms of its two principal components: the sensory-discriminative component, which refers to the quality, intensity and spatio-temporal characteristics of the sensation, and the motivational-affective component, which refers to its negative valence and aversion (Melzack and Wall, 1965; Melzack and Casey, 1968; Gracely et al., 1978). These

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components can be measured by verbal descriptors (Melzack, 1975; Gracely et al., 1978). There is growing interest in understanding the effect of hypnosis on the sensory and affective components of pain (Patterson and Jensen, 2003). The results of the various investigations are not totally conclusive on this point and it seems to be accepted that hypnosis has greater influence on the affect of pain than on the sensation of pain (Price et al., 1987; Meier et al., 1993; Price, 1999). There are also studies that indicate that analgesia suggestions are no more effective than suggestions of well-being and comfort at reducing the sensation of pain (Kiernan et al., 1995). Other authors, however, indicate that the specific dimension in which hypnotic suggestion acts depends on the content of the instruction (Rainville et al., 1999) and that analgesia suggestions and relaxation suggestions have different effects on the reduction of pain (Sachs, 1970; Dahlgren et al., 1995; De Pascalis et al., 1999).

There are very few studies on the effects of hypnosis on fibromyalgia, even though fibromyalgia is the most common cause of chronic muscular–skeletal pain, with an approximate prevalence of 2% in the general population (Russell, 2001; Busquets et al., 2005). Haanen et al. (1991) showed that the muscular pain, fatigue, sleep disorders and overall assessment of patients treated with hypnotherapy improved to a greater extent than in patients treated with physical therapy. These benefits were maintained after a follow up of 24 weeks. Wik et al. (1999), in a study in which they measured cerebral blood flow in a sample of patients with fibromyalgia, found that the patients experienced less pain during hypnosis than when they were at rest. There are also very few studies on the use of relaxation in fibromyalgia (Keel et al., 1998; Fors et al., 2002).

In our study, hypnosis is understood to be “a social interaction in which one person, designated the subject, responds to suggestions offered by another person, designated the hypnotist, for experiences involving alterations in perception, memory and voluntary action” (Kihlstrom, 1985), while relaxation is understood as “a systematic approach to teaching people to gain awareness of their physiological responses and achieve both a cognitive and psychological sense of tranquility” (Arena and Blanchard, 1996). Despite defining the concepts of hypnosis and relaxation, we cannot forget that both techniques can differ in terms of their names or of their theoretical context, but be highly similar in practice (Schultz, 1969; Barber, 2001; Gay et al., 2002).

The aims of our study are: (1) to compare the relative effects of analgesia suggestions and relaxation suggestions on clinical pain, and (2) to compare the relative effect of relaxation suggestions when they are presented as “hypnosis” and as “relaxation training”.

2. Method

2.1. Participants

Forty-five patients attended at the Pain Clinic of the Joan XXIII University Hospital in Tarragona, diagnosed with fibromyalgia by a rheumatologist following the criteria of the American College of Rheumatology (Wolfe et al., 1990). The participants were required to have been suffering from pain for at least 6 months. A total of 86.7% of the sample are women and the remaining 13.3% men. The mean age is 43.7 years old [range 25–68]. Of all the participants, 82.2% are married, 6.7% separated, 2.2% widowers and 8.9% unmarried. As far as education is concerned, 60% have completed their primary education, 26.7% secondary education and 13.3% higher education. The mean duration of pain is 106.5 months [range 6–360]. All the patients were following conventional pharmacological treatment with analgesics, antidepressants, hypnotics and myorelaxants.

2.2. Measures

The description of pain was assessed using the McGill Pain Questionnaire (MPQ) (Melzack, 1975; Spanish adaptation by Lázaro et al., 1994). Although the whole of the test was applied, the study only took into account the Pain Rating Index Sensory (PRI-S) and the Pain Rating Index Affective (PRI-A).

Pain intensity was assessed using a Visual Analogue Scale (VAS) which consists of a 10 cm line anchored by two extremes of pain: “no pain” and “worst possible pain”. Subjects are asked to make a mark on the line which represents their level of pain intensity. The scale is scored by measuring the distance from the “no pain” side of the line to the subject’s mark. This system is widely used in clinical and experimental contexts, and has been proved to be useful for assessing the intensity of pain in patients with chronic pain (Jensen et al., 1986).

2.3. Procedure

The patients were asked to go to the surgery where they were invited to participate in the study. Of the 48 patients who were invited to take part, 45 accepted. After their demographic and clinical data had been collected, the participants indicated the characteristics of their pain with the VAS and the MPQ. They were then randomly assigned to one of the three conditions. The experimental condition and the assessment were carried out by two different researchers. The participants were invited to lie down on a comfortable, reclining chair with arm rests and the experimental condition was applied. Once over, the participants got up from the chair and did the VAS and the MPQ once again.

2.4. Experimental condition procedures

Experimental condition 1: “Hypnosis with relaxation suggestions”. This experimental condition was presented as a hypnosis technique. Participants were asked to stare at an external stimulus and at a particular moment close their eyes. A chain of suggestions were made using palpebral catalepsy, catalepsy of the vocal cords and the raising of an arm. Immediately afterwards, they were asked to visualize a leaf swaying on the branch of a tree and then floating slowly to the ground. This image was associated with the descent of the arm and deeper hypnosis. This procedure lasted for about 10 min. Subsequently, participants were asked to focus their attention on imagining on a pleasant beach (beforehand, they had been asked whether this would be a suitable image). They were advised to think about all the stimuli associated with the image (visual, auditory, tactile, kinesthetic, olfactory) and also about all the associated sensations of relaxation and well being. The technique lasted for about 20 min.

Experimental condition 2: “Hypnosis with analgesia suggestions”. This experimental condition was presented as a hypnosis technique. The same chaining procedure and deeper hypnosis as in the previous technique were used. After 10 min, instead of being asked to imagine a relaxing image, the participants were asked to imagine a liquid or blue analgesic stream that filtered through their skin and reached different parts of their body (muscles, joints, bones, internal organs). It was suggested that the liquid soothed the pain in the most affected areas, eliminated the tension, and created feelings of well being. The technique lasted for about 20 min.

Experimental condition 3: “Relaxation”. This experimental condition was presented as a relaxation technique. For 5 min, the patients were shown how to relax various parts of the body, beginning with feet and finishing with the head. Then, for 10 min, they were told to focus on their diaphragmatic breathing. Finally, feelings of well-being and general relaxation were suggested for 5 min. The technique lasted for 20 min.

The data were statistically analysed using the SPSS programme for Windows.

3. Results

The three groups of participants were homogeneous. No significant differences were found in age, distribution by sex, duration of pain, marital status or educational level (see Table 1). Neither were any significant differences found between the pre-experimental condition values of VAS, PRI-S and PRI-A in the three groups.

As can be seen in Table 2, the t-test for related samples indicates that the VAS, PRI-S and PRI-A values decrease significantly after the application of each of the techniques, although they do not all decrease in the same proportion. Relaxation suggestions led to a 29% decrease in the pain intensity (VAS), a 39% decrease in sensory aspects (PRI-S) and a 61% decrease in the affective dimension (PRI-A). With analgesia suggestions, the percentages of reduction were 71% (VAS), 76% (PRI-S) and 81% (PRI-A). Finally, relaxation led to reductions of 43% (VAS), 27% (PRI-S) and 53% (PRI-A).

To determine whether there was any difference between the three experimental conditions, the difference

Table 1
Demographic data

Group	Age	Sex		Pain duration	Formal education			Marital status		
		Male	Female		Low	Mid	High	Married	Separated	Single
General	43.7 SD 8.6	6 (13%)	39 (87%)	106.6 SD 795	27 (60%)	12 (27%)	6 (13%)	38 (84%)	3 (7%)	4 (9%)
Experimental condition 1	48.1 SD 7.5	3 (20%)	12 (80%)	122.8 SD 99.9	10 (67%)	2 (13%)	3 (20%)	11 (74%)	2 (13%)	2 (13%)
Experimental condition 2	46 SD 9.3	1 (7%)	14 (93%)	103.7 SD 76.9	10 (67%)	4 (26%)	1 (7%)	13 (86%)	1 (7%)	1 (7%)
Experimental condition 3	47.7 SD 9.2	2 (13%)	13 (87%)	93.2 SD 58.9	7 (47%)	6 (40%)	2 (13%)	14 (93%)	0 (0%)	1 (7%)

Table 2
Comparison of pre-experimental condition and after-experimental condition mean pain index

Mean pre-after	Experimental condition 1	Experimental condition 2	Experimental condition 3
VAS 1–VAS 2	5.5–3.9** (SD 2.20–2.44)	5.8–1.7** (SD 2.27–1.68)	5.8–3.3* (SD 2.68–2.58)
PRI-S1–PRI-S 2	22.9–13.9** (SD 5.47–8.24)	26.2–6.3** (SD 9.32–6.99)	20.7–15.1* (SD 7.51–8.04)
PRI-A1–PRI-A 2	4.4–1.7** (SD 2.32–2.12)	4.3–0.8** (SD 2.49–1.01)	4.7–2.2** (SD 0.56–0.50)

* $p < 0.01$.

** $p < 0.001$.

Table 3
Comparison of the effect of the experimental conditions

Experimental conditions	VAS 2	PRI-S2	PRI-A2
Condition 1 vs Condition 2	*	**	***
Condition 1 vs Condition 3	***	***	***
Condition 2 vs Condition 3	*	**	***

* = $p < 0.01$, ** = $p < 0.001$, *** = not significant.

in the pre- and post-session scores was calculated and ANOVA was carried out. Significant changes were found between the three experimental conditions in the VAS score of pain intensity [$F(2, 42) = 6.969$; $p < 0.002$] and in the MPQ-PRI-Sensorial score [$F(2, 42) = 17.019$; $p < 0.0001$], but not in the MPQ-PRI-Affective [$F(2, 42) = 0.958$; $p < 0.392$] (see Table 3). Post-hoc multiple comparisons showed that there was a significant difference in the VAS score for pain intensity between hypnosis with analgesia suggestions and hypnosis with relaxation suggestions (Tukey test, $p < 0.005$), and between hypnosis with analgesia suggestions and relaxation (Tukey test, $p < 0.009$). The difference was even more significant when the values of the sensorial component of pain (PRI-S) were compared, both between hypnosis with analgesia suggestions and hypnosis with relaxation suggestions (Tukey test, $p < 0.0001$), and between hypnosis with analgesia suggestions and relaxation (Tukey test, $p < 0.0001$). On the other hand, there was no difference between hypnosis with relaxation suggestions and relaxation in any of the measures compared.

4. Discussion

The study has two essential findings: (1) that hypnosis followed by suggestions of analgesia has a greater effect on the intensity of pain and the sensorial dimension of pain than hypnosis followed by suggestions of relaxation; (2) that the effect of hypnosis followed by suggestions of relaxation is no greater than that of relaxation.

Under the condition of hypnosis we used two different types of suggestion. The suggestion of a blue, analgesic stream filtering into the painful area can be regarded as an indirect suggestion of *focused analgesia*. The relaxing suggestion of visualizing a pleasant beach can be regarded as a *dissociative imagery* suggestion (Price, 1999). The changes in pain intensity and in the sensorial components of pain were greatest with the suggestion of focused analgesia. This result shows that the content of the suggestion is important and indicates that some suggestions are more effective than others at controlling pain (Sachs, 1970; Stacher et al., 1975; Dahlgren et al., 1995; De Pascalis et al., 1999; Rainville et al., 1999).

If we focus on pain intensity variable, our findings are congruent with those of De Pascalis et al. (1999). When

they compared the analgesic effects produced by the experimental conditions of deep relaxation, dissociative imagery, focused analgesia and placebo, they found that focused analgesia was the technique that most reduced pain. Stacher et al. (1975) also indicate that hypnosis plus suggestions of analgesia decreases the intensity of pain to a greater extent than hypnosis plus suggestions of relaxation, although they only measured the intensity of the pain to determine the effect of the changes produced. Dahlgren et al. (1995) conclude, as we do, that analgesic hypnosis reduces the intensity of pain to a greater extent than the affective dimension, whereas relaxing hypnosis reduces the affective component to a greater extent than the intensity.

As far as the sensory and affective dimensions of pain are concerned, our results indicate that analgesic suggestion has a greater effect on the sensation of pain than the suggestion of relaxation. On the other hand, the suggestion of analgesia has not proved to be more effective than the suggestion of relaxation on the affective dimension of pain. This result is congruent with the findings of Rainville et al. (1999), who show that the suggestion of analgesia modifies both the sensory and the affective components of pain. However, suggestion that aims to modulate the affective component, does not modify the sensory component. Modulation of the sensory dimension of pain seems to produce a parallel modulation in the affective dimension (Price, 1999). Our results also coincide with those of Kiernan et al. (1995) because they show that suggestions of analgesia do not modify the affective components of pain any differently to suggestions of comfort and well-being. Our results are different, however, because they indicate that suggestions of sensory analgesia are not more effective than suggestions of well-being at modifying the sensory component of pain.

The second conclusion from our study indicates that there is no difference between the results obtained by hypnosis with suggestions of relaxation and the results obtained by relaxation. This corroborates the data that are available on this issue in the literature (Patterson and Jensen, 2003). As has already been pointed out in the introduction, defining the difference between hypnosis and relaxation is a complex task because both procedures contain components of relaxation and the focusing of attention (Syrjala and Abrams, 1996; Gay et al., 2002) and there seem to be no empirical differences between them (Syrjala et al., 1995). In our study, hypnosis with suggestions of relaxation differed from relaxation in that the procedure was given the label of hypnosis and in that participants were asked to visualize relaxing images. In the procedure described as relaxation, the patients only had to focus their attention on the bodily sensations of relaxation and on their own breathing. We believe that the lack of difference between the results

of both procedures is due to the fact that they both use suggestions that are exclusively of well-being and comfort, thus focusing only on the affective component of pain. Our results corroborate those of De Pascalis et al. (1999), who concluded that hypnotic analgesia is neither the result of relaxation, nor a question of distracting attention.

Our study has several, important drawbacks. The relatively small number of participants is a drawback that limits the power of the statistical analyses and the generalization of the results obtained, although the significance of the differences between the experimental conditions suggests that they are important. Another drawback was the fact that the application of each experimental condition was not completely homogeneous. There may have been prosodic changes in language or other variations as a function of the participants' responses. It should also be borne in mind that the same researcher (the first author) applied all the experimental conditions. Although this is not exceptional in this sort of study (see Faymonville et al., 1997; Benhaiem et al., 2001; Patterson and Jensen, 2003) and it limits the strength of the results, it cannot completely conceal their importance. Another important drawback of the study is that hypnotic suggestibility was not measured. There is evidence to suggest that highly suggestionable subjects are more responsive to hypnotic suggestion in experimental pain. In clinical pain, however, scale-assessed suggestibility is much less predictive of the response to intervention with hypnosis (Montgomery et al., 2000; Barber, 2001; Patterson and Jensen, 2003). In clinical samples, patients with low suggestibility have similar levels of response to hypnotic suggestions as patients with high suggestibility (Jensen and Barber, 2000; Gay et al., 2002).

Despite the study's drawbacks, these findings indicate that analgesic suggestion can decrease pain intensity and the sensation of pain in patients with fibromyalgia. Analgesia suggestion should be studied in the context of intervention programmes designed for this type of patients. Finally, the findings of this study have implications for: (1) understanding the importance of the suggestions used in hypnosis; (2) understanding the differences or similarities between hypnotic relaxation and relaxation training.

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