

Complex Regional Pain Syndrome, type 1: Long-Term Remission with Hypnosis Suggests a Different Paradigm for the Disease

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Abstract:

Outcome resulting from the integration of hypnosis with treatment for Complex Regional Pain Syndrome, type 1 (CRPS-1) is reported in forty-one patients considered refractory to medical and rehabilitative management alone. Eighty-five percent demonstrated a high hypnotic capacity. Fifteen percent had a low hypnotic capacity. None demonstrated average hypnotic capacity. Using hypnosis, patients with high hypnotic capacity were able to alter labile features and other physical manifestations of the disease. With continued use of hypnosis as part of an integrated treatment program, sixty percent of the sample gained long-term remission. Remission is defined here as absence of symptoms, non-dependence on drugs or electro-therapy and a restoration of function. Patients in remission were able to return to their pre-illness occupational style. Most experienced reversal of tissue wasting secondary to the disease.

Since patients were grouped at either end of the hypnotizability scale, and since no patient studied demonstrated an average capacity, the possibility that average hypnotizability affords invulnerability to the disease deserves study. The neurological and behavioral patterns of CRPS-1 may be adopted as the physiological signature of a dissociated ego-state. We propose a paradigm for the disease suggesting that the behavioral and psychological impact of CRPS-1 becomes a critical maintaining factor, and that remission is attainable for a majority of sufferers if this impact receives adequate treatment, provided they are able to moderate autonomic function with medical hypnosis. Features of the disease suggest that loss of control over autonomic function in CRPS-1 may be a consistent finding and supports that psychological dissociation may prove a predisposing and maintaining factor for the disease.

Key words: Complex Regional Pain Syndrome, type 1, CRPS-1, Reflex Sympathetic Dystrophy, hypnosis, ego-state therapy.

Introduction:

Complex Regional Pain Syndrome, type 1, (CRPS-1) is a painful condition that infrequently follows trauma or surgery, causing a greater degree of pain than might be expected from the injury's severity. Associated with pain is marked hypersensitivity to touch, lability of perfusion causing various degrees of pallor or hyperemia in the affected limb and sudomotor effects (sweating). Atrophy of tissues is common, including skin, nails, hair, muscle and bone. Associated muscle spasm leads to restriction of movement and edema can become very severe in affected limbs. Later in the disease, affected joints can become rigid as their capsules lose flexibility. CRPS-1 can occur spontaneously, after cerebro-vascular accident and sometimes after the use of barbiturates¹. In addition to its physical origin, a physical paradigm for the disease is supported by easily measurable physical and physiological changes. Further support is lent by the absence of specific emotional precursors^{2,3}. At the same time, the illness has an obvious and severe emotional impact and clinicians are generally but non-specifically concerned that a psychological component to the disease exists. Depression and anxiety are almost universal consequences in long-term cases, and in this clinic, more than half the patients reveal that they have had suicidal ideation at some time during their illness. While we support that CRPS-1 has a physical root, the outcome from physical treatments that do not adequately address the emotional impact, such as analgesics, chemical or surgical interruption of somatic or autonomic function, electrical and rehabilitative therapy and so on, has not consistently led to remission, and expectedly provides palliation of symptoms only. (Fig. 1) Improvement in medical and rehabilitative management have, in recent years, provided somewhat improved outcome, but CRPS-1 remains an illness that defies a consistent medical approach. Refinement of treatment for the emotional aspects of CRPS-1 is the emphasis of this clinic and our report describes outcome from the integration of advanced psychological management with a conventional medical approach.

Review of the literature uncovers a small number of papers that show favorable outcome when behavioral management was integrated into the treatment plan. In the 40's, Shumaker⁴ treated a small number of patients with barbiturate-induced hypnosis with good results, although long-term follow-up was not reported. In 1978, Blanchard⁵ reported remission in 60% of patients using biofeedback as a form of autogenic training and in 1990, Grunert⁶ published similar results. Gainer⁷, in 1992, described the use of hypnosis in 3 patients leading to long-term remission, and Flemming⁸, in 1992, reported that 8 of 13 patients reached long-term remission when medical hypnosis was added to standard medical management. These data were not collected from controlled studies, and it was not suggested that these patients represented the overall population of sufferers. However, they offer a glimmer of hope that a paradigm that accepts behavioral aspects of the disease as a treatable entity shows therapeutic promise. Many people can modify autonomic function by the generation of images in the mind. For example, thoughts of ice cream or fear can lead to salivation or a racing heart. Response to sexual fantasy is another example of specific autonomic change in response to mental imagery. Alteration of perception of pain can also result from mental imagery, which we believe has application in CRPS-1. If, for patients with CRPS-1, a training were available that could lead patients to control the autonomic patterns that seem to underlie CRPS-1 during much of its course, the subjective and objective features of the disease might respond, allowing rehabilitation and remission. Since 1992, we have continued to apply hypnosis and autogenic training as part of an integrated medical service in the treatment of CRPS-1. This report describes outcome in the first 41 cases.

Method:

Outcome in 41 consecutive cases of CRPS-1 considered refractory to various medical, electrophysiological and rehabilitative therapies was followed after introduction of specific forms of psychological treatment and hypnotherapy into an integrated treatment protocol. Patients self-selected into or out of therapy, and there was no attempt to randomize patients to control or study groups. Patients were excluded from this report if there was a demonstrable source of pain other than CRPS-1 since this suggested an alternative and more appropriate diagnosis and we report only patients reachable by phone for long-term follow-up. Most patients attended after diagnosis at academic pain management centers at which they had not responded to treatment. Criteria used to support the presenting diagnosis included a history of pain, more intense than expected after a precipitant injury or operation persisting far longer than expected. Hypersensitivity to touch (allodynia or dysesthesia), circulatory lability, various degrees of edema and atrophy of tissues. Sudomotor changes and muscle spasm were generally present. Response to sympathetic interruption (stellate ganglion block or differential epidural) was utilized to confirm that sympathetic activity was involved in maintaining the labile features of the disease, uncover sources of pain unrelated to sympathetic activity, and to provide an experiential anchor for future hypnotherapeutic intervention. All patients suffered peripheral vasospasm as the predominant circulatory condition and most had periods of hyperemia. Duration of the disease ranged between 6 months and 8 years. Patients self-rated the presence and severity of symptoms as: constant and generally severe; infrequent and generally mild; or absent. Ability to control pain and other labile manifestations of the disease was self-reported. Ability to work was self-rated as: not at all; part-time; or full-time.

All patients were evaluated for the capacity to use hypnosis using a modification of the Hypnotic Induction Profile (HIP - Spiegel⁹). Patients with low or absent capacity to use hypnosis were followed, but treatment was limited to medical procedures directed at palliation of symptoms rather than remission as they were unable to use hypnosis to modify symptoms of CRPS-1. Various hypnotherapeutic and other modalities were integrated into treatment in patients having a high capacity, as follows:

1. Provision of symptomatic relief using:
 - a. General relaxation techniques.
 - b. Direct suggestion under hypnosis.
 - c. Specific metaphor designed to alter perception of pain and other labile features of the disease.

2. Reinforcement techniques encouraging a pain-free state. These included encouragement, specific ego-strengthening techniques and myofascial therapy.
3. Cognitive, insight-oriented and ego-state therapy, designed to help patients understand and reverse any association that had developed between physiological patterns of CRPS-1 and emotional, environmental or defensive conditions. It is important to note that treatment for psychopathology only occurred if signs of psychopathology emerged as therapy progressed, and only with the active cooperation of the patient.

While patients presenting with chronic pain requested treatment for chronic pain, and not for unperceived and possibly irrelevant psychological issues, all patients underwent psychological evaluation to observe affect and to seek signs or history of psychopathology. In particular, signs of anxiety, depression and dissociative symptoms were sought. Cases that appeared to require particular skill in pharmacological management of psychiatric problems were referred for psychiatric evaluation. On the assumption that physiological patterns of CRPS-1 can enmesh with subconscious autonomic control, ego-state therapy was introduced as an integral part of the hypnotherapeutic process.

Medical management included attempted symptom reduction using a gradation of applicable technique beginning with intravenous lidocaine and progressing to sympathetic blockade, either directly to the sympathetic chain or by differential epidural blockade. Since many patients reported pain associated with muscle spasm, myofascial therapy was provided and trigger point injections were used if spasm was limited in extent. Intravenous and trigger point injections greatly facilitate myofascial therapy. Muscle relaxation was effective in reducing pain and greatly facilitated other forms of rehabilitation therapy including movement and gait reeducation.

Progress was followed by self-reporting of labile features of the disease including function, need for analgesic medications, nicotine use and emotional impact of the disease. These reports were converted to a numeric rating scale of pain and functional status, but in this report, an understanding of clinical change is based on the three major factors of the disease, namely need for analgesic use, function and pain scores.

Results:

Outcome data is summarized in Fig. 3.

Five of the 41 patients had a very low capacity to use hypnosis. The remainder demonstrated a high capacity and all were able to modify labile features of CRPS-1 using hypnotic method. There were no patients with an average capacity. Skin temperature was measured in 5 patients with high hypnotic capacity. All of these were able to increase skin temperature using hypnotic metaphor.

Before treatment, 83% had severe and constant symptoms, while 17% had severe but inconstant symptoms. No patients had mild or absent symptoms or were able to control symptoms without the use of medications. Seventy percent were unable to work in any gainful capacity, 16% were able to work part time, and 14% were able to work full time despite having the disease.

After treatment, the percentage of patients with constant, severe symptoms reduced to 17; nine percent had frequent symptoms over which they had limited control, 40% had occasional recurrence of mild symptoms that they could easily control on their own, and 34% were totally symptom free. Fifty-seven percent were working full-time, 16% worked part-time and only 27% were unable to work.

In the group of patients having a high capacity for using hypnosis, about one third were able to incorporate hypnotherapeutic routines into their daily lives, using these to reduce symptoms, progressing rapidly to remission. One third found that, despite having a high capacity for hypnosis, symptom reduction was made difficult by other sources of pain such as arthritis, mononeuropathy, nicotine use or nerve entrapment. The remaining third of the highly hypnotizable patients demonstrated the ability to attenuate symptoms but tended not to engage with therapy. Continued treatment was offered with the goal of altering motivation; however, 2 patients withdrew. In this group, those able to remain in treatment gained remission. This group

included twenty percent of the entire sample and they were found to suffer from diagnosable dissociative disorders. Altogether, two thirds of the entire sample gained long-term remission characterized by termination of analgesic medications and absence of symptoms, or presence of occasional mild symptoms that patients found they could abolish unaided using self-hypnosis.

In the group of highly hypnotizable patients, it was not readily apparent during initial evaluation which patients were going to withdraw from therapy against medical advice. Three patients had illness of obscure etiology

Conclusions:

In this sample of 41 patients bearing a credible diagnosis of intractable Complex Regional Pain Syndrome, type 1, 85% had a high capacity for the use of hypnosis and were able to alter the perception of pain and modify other labile features of the disease using this modality. Our clinical impression suggested that despite high motivation, difficulty was experienced because of: previously unrecognized pathology causing pain; nicotine use; or pain of sufficient intensity to prevent focus on the techniques. In only 3 patients was the pathophysiology or behavioral nature of the disease obscure. No patient continuing to use nicotine responded favorably to treatment. Psychological reasons for difficulty in reaching establishing control over the disease and gaining remission included conflicted agendas secondary to dissociative disorders.

In this sample, hypnotherapy and psychological method seemed to provide pivotal modalities when seamlessly integrated into a program of standard medical management for Complex Regional Pain Syndrome, type 1.

These observations support consideration of a new paradigm for Complex Regional Pain Syndrome, type 1 based on the concept that the behavioral and psychological aspects of the disease become critical maintaining factors. Adequate treatment of these aspects can lead to successful and long-term remission in patients who have a high capacity for the use of hypnosis. Alternative explanations for this result might include that CRPS-1 may be the presentation of psychopathology such as a conversion disorder, however, current definitions of this exclude tissue damage directly caused by the psychological disturbance.

Ego-states are considered to be the building blocks of personality. They are the ways we present ourselves to and relate with our society. They have characteristics of mood, verbal and body language and each has a physiological signature. From situation to situation, we choose between a "family" of ego-states, learned as we progress through life, selecting one that we perceive as appropriate for current circumstances. As an example, personality while driving may be very different to that seen when engaged in other activities. In health, the ego-states we use intercommunicate so that knowledge of events occurring while each state is active is recognized and remembered by the others. Hypothetically, a predominant ego-state exists which serves as a central core, directing the family of ego-states as an integrated whole. While ego-states moderate communication, they may also serve a protective role, and may isolate or protect an individual who is unable to physically escape from severe stress or trauma. The screen may be so effective that the family of ego-states remains protected from knowledge of events that occurred while the protective ego-state was dominant. In this way, dissociated ego-states become free to develop their own agendas and perform actions that, while meeting their own needs can be inappropriate for reality and for the well being of the individual as a whole. They may avoid control by the central core and allow superficial layers of memory to ignore their actions and purpose. One of the prime components of hypnotizability is dissociative capacity. Patients with high hypnotizability have, by definition, a high dissociative capacity, and may develop a pattern of handling and escaping from stress by using dissociation, particularly if the stresses are severe.

We infer that in CRPS-1, autonomic patterns of the disease begin with an autonomic response to a precipitant injury, which in time becomes linked by association or conditioning with current physical, social and environmental events, and hence become the physiological signature of an ego-state. Once established, the signature can persist, or re-emerge, triggered by association whenever an associated event is experienced, whether real or imagined. If the ego-state is dissociated, it will remain unavailable for spontaneous control by the central core, but may respond to ego-state therapy. One form of ego-state

therapy involves a process by which the patterns comprising a dissociated ego-state are invited to emerge with an identity clear enough to engage in dialogue and therapy. The goal of therapy is to examine the state's purpose and activities, allowing its functions to be performed in ways that are positive for the individual as a whole. It is important to remember that the patient is not represented by a group of individuals, but is at all times a single individual. The preceding is simply a pragmatic view of a therapeutic approach which we presumed would be effective in these patients. Some patients demonstrating a high capacity for the use of hypnosis were not able to modify symptoms. In these patients, local anesthetic techniques were used to provide analgesia, giving an experiential anchor to facilitate future hypnotic sessions.

Two patients able to reduce labile features of the disease withdrew from therapy. Attempts were made to retain them, the focus of treatment changing to motivational issues. Myofascial therapy was provided for all patients because of its direct effect on muscle tension¹⁰, to release trigger points frequently associated with CRPS-1 and for reinforcement of a reduced pain behavior. Myofascial therapy has been shown to be effective as a sole treatment modality for children suffering from CRPS-1¹¹. Myofascial therapists were trained to use simple relaxation and visualization techniques to facilitate these processes. Goals of therapy did not permit myofascial therapy or any other form of physical or rehabilitative therapy if it increased pain levels. All patients were followed by telephone interview at approximately 6 month intervals. Patients were asked to self-report the intensity and frequency of symptoms, ability to control symptoms and their ability to work. In general, the algorithm in Fig. 2 describes the process of therapy.

Discussion:

Federn's (1952)¹¹ original concept of "ego-states" was refined and described by Watkins and Watkins (1979, 1980)^{12,13}. They consider personality to be built of an organized system of different behaviors termed ego-states, bound together by a common principle. Each ego-state's boundary is more or less permeable. Ego-states have more or less autonomy in relation to other states and overall personality. Their different characteristics become the dominant feature of overall personality depending on the perceived needs of current circumstance. Ego-states are characterized by verbal style, body language and mood and each carries a reproducible physiological signature, for example, characteristic heart rate, skin perfusion or variation within any labile physiological parameter. We build ego-states during personal growth and development, by copying from others, from cognitive choice and by our own spontaneous response to new circumstances, all of which can be adopted as patterned behavior. Ego-states can be understood as the characteristic neuro-psycho-physiological state that occur typically in an individual's varying social roles and adaptations to the environment.

Psychological roots for CRPS-1 have never been demonstrated. Since psychological problems that concern people at either end of the scale of hypnotizability are different, and in our sample, both extremes of the scale were represented, we agree that a common psychological root for CRPS-1 is unlikely to emerge. At first glance, the use of psychological services when psychological issues are not the target of therapy seems paradoxical. However, the development of CRPS-1 involves the autonomic nervous system, which is also the vector for the perception and experience of emotion and is intimately related to both normal and pathological aspects of an individual's psychology. The almost universal association between stress and intensity of symptoms supports this, as does the high placebo response. In this sample, psychological services were used, not as primary therapy for psychological pathology, but instead as treatment designed to alter perception of pain and autonomic patterns associated with CRPS-1. We conclude that autonomic patterns of the illness were accessible by hypnosis in this sample because all patients tested were able to alter skin temperature with the modality. Since 85% of this sample seemed able to control symptoms using hypnosis and without the use of medications or procedures, the argument is strengthened. We do not regard the hypnotic state as a magical entity, and control is control, whether in a hypnotic state or not. The presence of any form of inherent autogenic control for CRPS-1 supports that behavior and psychological factors are involved with, rather than causative in this disease. Conspicuously absent from this sample of patients were individuals with average hypnotizability. This is especially noteworthy because, in a normal population, hypnotizability follows a normal distribution so that the greatest numbers of people possess average ability. It may be more adaptive in our species to have an average capacity rather than to exist at the extremes of the scale. The high hypnotic capacity seen in 85% of our sample is present in only about

10% of a normal population and this prompts the question whether or not a high dissociative capacity is a pre-disposing factor for developing CRPS-1. We propose for future study that healing after injury in patients with an average capacity is uncomplicated because the mind-body connection in these patients is uncomplicated. It may not as easily link the autonomic patterns of CRPS-1 with an ego-state, or it may naturally permit those patterns to fade as healing occurs. Those with low hypnotizability are capable of conditioned learning, but in these patients, mind-body communication is absent, preventing them from directing the patterns to fade as needed. The curious paradox in those patients with high hypnotizability is that, while they demonstrate fluent mind-body communication, many of them seem unable to allow the patterns to fade without specific training. The explanation we propose is that these patients characteristically handle stress using a dissociative mechanism. Autonomic patterns of CRPS-1 become the physiological signature of a dissociated ego-state and are therefore not accessible to the central core for directed alteration. These concepts support the role of ego-state therapy in the treatment of CRPS-1, and in particular, explain limited outcome in patients treated by hypnotherapy in which only direct suggestion or metaphor for the reduction of symptoms were used. The paradigm by which CRPS-1 is treated purely as a physical issue without dealing with its emotional impact is demonstrably wrong. Outcome described by authors that have used autogenic training to treat CRPS-1 strongly suggests that we examine the behavioral impact and psychological aspects of the disease as critical maintaining factors, that can and must be treated before remission is likely to occur. There is a precedent for applying psychological treatment for physical disease. For example, Ornish¹² showed that meditation added to a regime of exercise and nutrition is associated with reversal of coronary artery disease. Psychological technique as primary treatment for CRPS-1 may be crucial, even though the illness is physical in nature and no psychological roots have ever been found. It may mean that in highly dissociative patients, integration of medical management and advanced psychological method is the only way to predictably lead CRPS-1 into remission. In no way does this imply that CRPS-1 is all in the head. Instead, we see CRPS-1 as simply a physically based illness which is strongly influenced by behavioral factors.

Concepts for Future Study.

CRPS-1 may be precipitated by an inflammatory response to injury, mediated in part by autonomic activity. Autonomic activity may be maintained after healing has occurred by a process of learning or conditioning. It is possible that continuation of the sympathetic response to injury in CRPS-1 represents normal although exaggerated physiological process driven by conditioned autonomic activity, and is allowed to happen because of a failure of communication between cognitive and autonomic processes.

Modulation of labile features of CRPS-1 by stress or other non-physical change seen in most patients strongly points to the coexistence of behavioral and physical components in this illness.

Ego-states are the building blocks of behavior and personality and each state has a reproducible signature including mood, body and verbal language and autonomic balance. CRPS-1 may be considered to be the autonomic signature of a dissociated ego-state.

A majority of patients having fluent communication between mental images and autonomic processes can use ego-state therapy under hypnosis to gain long-term remission from CRPS-1.

CRPS-1 is NOT "all in the head," or devoid of physical reality. Response to treatment in this sample followed an integration of services including physical, medical and psychological processes.

No evidence has ever been produced that distinguishes whether the physical and physiological changes associated with CRPS-1 are the result or the cause of patterns commonly associated with the disease.

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