COMPLEX REGIONAL PAIN SYNDROME LITERATURE

Am J Ther. 2009 Mar-Apr;16(2):147-54

Practical management of complex regional pain syndrome.

Hsu ES.

Complex regional pain syndrome (CRPS) describes a diversity of painful conditions following trauma, coupled with abnormal regulation of blood flow and sweating, trophic changes, and edema of skin. The excruciating pain and diverse autonomic dysfunctions in CRPS are disproportionate to any inciting and recovering event. CRPS type I is formerly identified as "reflex sympathetic dystrophy." CRPS type II is the new term for "causalgia" that always coexists with documented nerve injury. The present diagnostic criteria of CRPS I and II depend solely on meticulous history and physical examination without any confirmation by specific test procedure (or gold standard). There are only few clinical studies with large-scale randomized trials of pharmacologic agents on the treatment of CRPS. Bisphosphonates have been studied in multiple controlled trials, based on theoretical benefit of bone resorption, to offer pain relief and functional improvement in patients with CRPS. Many current rationales in treatment of CRPS (such as topical agents, antiepileptic drugs, tricyclic antidepressants, and opioids) are mainly dependent on efficacy originate in other common conditions of neuropathic pain. There are additional innovative therapies on CRPS that are still in infancy. No wonder all the treatment of individual CRPS case nowadays is pragmatic at best. Although the interventional therapies in CRPS (such as nerve blockade, sympathetic block, spinal cord and peripheral nerve stimulation, implantable spinal medication pumps, and chemical and surgical sympathectomy) may offer more rapid response, yet it is still controversial with unpredictable outcome. Nevertheless, we need to start pain management immediately with the ambition to restore function in every probable case of CRPS. An interdisciplinary setting with comprehensive approach (pharmacologic, interventional, and psychological in conjunction with rehabilitation pathway) has been proposed as protocol in the practical management of CRPS. It is crucial to have a high sensitivity value combined with a fair specificity in revising diagnostic criteria of CRPS. The validation and consensus for new rationalized diagnostic criteria of CRPS could facilitate further research to enhance clinical outcome including quality of life. These endeavors to minimize suffering from CRPS would certainly be appreciated by many patients and their loved ones.

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Ann Neurol. 2009 Mar 18;65(6):629-638.
Is reflex sympathetic dystrophy/complex regional pain syndrome type I a small-fiber neuropathy?
Oaklander AL, **Fields HL**.
Neurologist S. Weir Mitchell first described "causalgia" following wartime nerve injury, with its persistent distal limb burning pain, swelling, and abnormal skin color, temperature, and sweating. Similar post-traumatic symptoms were later identified in patients without overt nerve injuries after trauma. This was labeled reflex sympathetic dystrophy (RSD; now complex regional pain syndrome type I [CRPS-I]). The pathophysiology of symptoms is unknown and treatment options are limited. We propose that persistent RSD/CRPS-I is a post-traumatic neuralgia associated with distal degeneration of small-diameter peripheral axons. Small-fiber lesions are easily missed on examination and are undetected by standard electrophysiological testing. Most CRPS features-spreading pain and skin hypersensitivity, vasomotor instability, osteopenia, edema, and abnormal sweating-are explicable by small-fiber dysfunction. Small fibers sense pain and temperature but also regulate tissue function through neuroeffector actions. Indeed, small-fiber-predominant polyneuropathies cause CRPS-like abnormalities, and pathological studies of nerves from chronic CRPS-I patients confirm small-fiber-predominant pathology. Small distal nerve injuries in rodents reproduce many CRPS features, further supporting this hypothesis. CRPS symptoms likely reflect combined effects of axonal degeneration and plasticity, inappropriate firing and neurosecretion by residual axons, and denervation supersensitivity. The resulting tissue edema, hypoxia, and secondary central nervous system changes can exacerbate symptoms and perpetuate pathology. Restoring the interest of neurologists in RSD/CRPS should improve patient care and broaden our knowledge of small-fiber functions.

Curr Pain Headache Rep. 2006 Apr;10(2):95-100.
Hyperbaric oxygen therapy in chronic pain management.
Yildiz S, **Uzun G**, **Kiralp MZ**.
Chronic pain is one of the frequently encountered clinical problems that is difficult to cure. Hyperbaric oxygen (HBO) therapy has been reported in chronic pain syndromes with promising results. In this review, we focus on the effectiveness of HBO in fibromyalgia syndrome, complex regional pain syndrome, myofascial pain syndrome, migraine, and cluster headaches. HBO may be beneficial if appropriate patients are selected. HBO is a reliable method of treatment. However, physicians performing HBO must be aware of oxygen toxicity. Another problem regarding HBO is the scarcity of centers administering it. Further research is required focusing on the optimal treatment protocol, the cost/benefit ratio, and the safety of HBO in chronic pain management.

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COMPLEX REGIONAL PAIN SYNDROME LITERATURE

J Int Med Res. 2004 May-Jun;32(3):258-62.
Effectiveness of hyperbaric oxygen therapy in the treatment of complex regional pain syndrome.
Kiralp MZ, **Yildiz S**, **Vural D**, **Keskin I**, **Ay H**, **Dursun H**.
In this double-blind, randomized, placebo-controlled study we aimed to assess the effectiveness of hyperbaric oxygen (HBO) therapy for treating patients with complex regional pain syndrome (CRPS). Of the 71 patients, 37 were allocated to the HBO group and 34 to the control (normal air) group. Both groups received 15 therapy sessions in a hyperbaric chamber. Pain, oedema and range of motion (ROM) of the wrist were evaluated before treatment, after the 15th treatment session and on day 45. In the HBO group there was a significant decrease in pain and oedema and a significant increase in the ROM of the wrist. When we compared the two groups, the HBO group had significantly better results with the exception of wrist extension. In conclusion, HBO is an effective and well-tolerated method for decreasing pain and oedema and increasing the ROM in patients with CRPS.

Pain. 2003 Jul;104(1-2):149-57
Tissue hypoxia in complex regional pain syndromes.
Koban M, **Leis S**, **Schultze-Mosgau S**, **Birklein F**.
Untreated complex regional pain syndrome (CRPS) may progress from acute stages with increased hair and nail growth in the affected limb to chronic stages with atrophy of the skin, muscles and bones. The aim of this study was to investigate whether tissue hypoxia could be one mechanism responsible for this late CRPS symptoms. Nineteen patients with CRPS and two control groups (healthy control subjects, surgery patients with edema) participated in this study. Skin capillary hemoglobin oxygenation (HbO(2)) was measured non-invasively employing micro-lightguide spectrophotometry (EMPHO). The EMPHO probe was mounted force-controlled onto the skin of the affected and unaffected hand. HbO(2) was measured at rest and during postischemic reactive hyperemia. HbO(2) did not differ between the right (58.20%+/-1.12) and left (57.79%+/-1.31, ns) hand in control subjects. However, in patients, HbO(2) of the affected side (36.63%+/-2.16) was significantly decreased as compared to the clinically unaffected side (46.35%+/-2.97, $P<0.01$). As compared to controls, HbO(2) in CRPS was reduced on both sides ($P<0.001$). Postischemic hyperoxygenation was impaired on the affected side in CRPS (60.81%+/-2.90)--as compared to the unaffected side (67.73%+/-1.50, $P<0.04$) and to controls (68.63%+/-0.87, $P<0.005$). The unaffected limb in CRPS did not differ from controls. Despite skin edema, pre- (49.06%+/-2.02) and postsurgery HbO(2) (53.15%+/-4.44, ns) were not different in the second control group. Our results indicate skin hypoxia in CRPS. Impairment of nutritive blood flow in the affected limb may be one factor contributing to atrophy and ulceration in chronic CRPS. The investigation of patients after surgery revealed that edema could not be the only reason for hypoxia.

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Clin J Pain. 1998 Jun;14(2):155-66
Complex Regional Pain Syndromes: Guidelines for Therapy
Stanton-Hicks M, **Baron R**, **Boas R**, **Gordh T**, **Harden N**, **Hendler N**, **Koltzenburg M**, **Raj P**, **Wilder**.
This report aims to present an orderly approach to the treatment of Chronic Regional Pain Syndrome (CRPS) types I and II through an algorithm. The central theme is functional restoration: a coordinated but progressive approach that introduces each of the treatment modalities needed to achieve both remission and rehabilitation. Reaching objective and measurable rehabilitation goals is an essential element. Specific exercise therapy to reestablish function after musculoskeletal injury is central to this functional restoration. Its application to CRPS is more contingent on varying rates of progress that characterize the restoration of function in patients with CRPS. Also, the various modalities that may be used, including analgesia by pharmacologic means or regional anesthesia or the use of neuromodulation, behavioral management, and the qualitatively different approaches that are unique to the management of children with CRPS, are provided only to facilitate functional improvement in a stepwise but methodical manner. Patients with CRPS need an individual approach that requires extreme flexibility. This distinguishes the management of these conditions from other well-described medical conditions having a known pathophysiology. In particular, the special biopsychosocial factors that are critical to achieving a successful outcome are emphasized. This algorithm is a departure from the contemporary heterogeneous approach to treatment of patients with CRPS. The underlying principles are motivation, mobilization, and desensitization facilitated by the relief of pain and the use of pharmacologic and interventional procedures to treat specific signs and symptoms. Self-management techniques are emphasized, and functional rehabilitation is the key to the success of this algorithm.

Zh Nevrol Psikhiatr Im S S Korsakova. 1997;97(11):33-5.
The treatment of a complex regional pain syndrome
Tuter NV, **Danilov AB**, **Poliakova LV**.
35 patients with complex regional pain syndrome (CRPS) were treated by hyperbaric oxygenation (HBO) and caffetin preparation. A significant decrease of pain was observed in all the patients after the treatment course. Intensity of pain was diminished according to visual analogous scale. Meanwhile considerable regression of autonomic disorders and weakening of anxious and depressive manifestations was noted too. The tendency to normalization of evoked skin potentials was also found. Some elevation of the threshold of nociceptive reflex was conditioned by displacement toward general increase of antinociception after the treatment. Effect of HBO therapy persisted during 6 months in 87% of the patients. Efficiency of caffetin was restricted by the time of its administration. The conclusion was made about possibility of successful treatment of CRPS patients by both methods.

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