Reflex Sympathetic Dystrophy (Complex Regional Pain Syndrome I): A Descriptive Case Study

Pahulpreet Kaur[1], Jaspreet Singh[2]

[1](B. P. Th), M.Sc. (Exercise and Sports Physiology) Gold Medalist
[2](B. P. Th), MSPT (Sports Physiotherapy)
MYAS-GNDU Department of Sports Sciences and Medicine, Guru Nanak Dev University, Amritsar

Corresponding Author: Pahulpreet Kaur

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ABSTRACT

Complex regional pain syndrome type I (CPRS I, formerly known as reflex sympathetic dystrophy) is a painful neuropathic disorder that develops after trauma affecting the limbs without overt nerve injury. The clinical features are spontaneous pain, hyperalgesia, impairment of motor function, swelling and autonomic abnormalities. Besides pain, autonomic (sympathetic) disturbances are characteristic clinical symptoms. These include regional abnormalities of cutaneous, vascular and sudomotor function. At present CPRS I is a pure clinical diagnosis and no objective test procedure exists to diagnose this entity with high sensitivity and specificity. The primary objective of physiotherapeutic modalities is goal-oriented function restoration, henceforth it's been proven that this syndrome has poor prognosis.

Keywords: Hyperalgesia, Autonomic abnormalities, Sympathetic disturbances, Sudomotor abnormalities, CPRS I.

INTRODUCTION

Complex regional pain syndrome type I (CPRS I, reflex sympathetic dystrophy) is a painful disorder that may develop as a disproportionate consequence of minor trauma affecting the limbs or of bone fracture, or as a consequence of remote process such as stroke and myocardial infarction (Warner et al; 1998). The clinical features are spontaneous pain, hyperalgesia, impairment of motor function, swelling. Besides pain, autonomic (sympathetic) disturbances are characteristic clinical symptoms (Boron and Maier, 1996). According to the international association for the study of pain criteria, the characteristic features require to establish the diagnosis of CPRS type I are as follows: i) The presence of an initiating noxious event or a cause of immobilization. ii) Continuing pain, allodynia or hyperalgesia with pain disproportionate to any inciting event. iii) Evidence at some time of edema, changes in skin blood flow, or abnormal sudomotor activity in the region of the pain. Motor disturbances and trophic changes such as altered nail and hair growth, may be observed in some cases. The clinical presentation consists of a triad of sensory, autonomic and motor signs and symptoms. Pain in CPRS I varies in quality from a deep ache to a sharp stinging or burning sensation. Often patients report that the pain is worsened by environmental (cold, humidity) and emotional (anxiety, stress) factors. Cutaneous hypersensitivity presents as pain on contact with clothing or exposure to a cold breeze.

Vasomotor changes cause diverse skin discoloration, including various hues of red and purple to mottled, ashen and gray. The presence of edema in the painful region gives a glossy and smooth appearance to the

skin. Sudomotor abnormalities range from hyperhidrosis to bone-dry skin. The vasomotor and sudomotor changes are variable not only between patients but also within individual patient over time. Motor disturbances in the affected limb may present as tremor, weakness, muscle incoordination, decreased range of motion, muscle spasm and dystonia. Dystonia in the lower extremity is typified by fingers fixed in flexion, or the clenched fist syndrome. Range of movement may be compromised on the affected side, and contracture may develop in severe cases. Earlier reports suggested that CRPS may progress through distinct, sequential stages with an early, an intermediate (dystrophic), and a late (atrophic) stage. The latter stage presumed irreversible, is characterized by trophic changes in skin, nails, hair and motor dysfunction.

CASE PRESENTATION

On 9th September 2024, A 50-year old male patient Manohar Singh along with his son visited to our physiotherapy OPD with the following chief complaints pain (region shoulder, wrist and forearm), tenderness (region wrist), swelling, restricted shoulder, elbow and wrist movements. Patient had a history of brutal assault, he had a personal dispute with some of the local goons, uncertainly one day at night time they forcefully entered into their house attacked him, ultimately hit his head with a stick resulting trauma to the skull. While giving history he certainly got apprehensive and told his son not to share any further information regarding his deteriorated condition, we also as professionals didn't find suitable to know more about his previous brawl history, so we professionally assessed all his signs and symptoms, without hampering his mental health.

ASSESSMENT

Pain at the shoulder manifested by burning pain and paresthesia, pitting edema (dorsum of the hand), decreased wrist flexion range, cyanosis of hand due to vasoconstriction and increased sweating, atrophied forearm muscles, sensory examination revealed extreme sensitivity to pain and touch (palmar aspect of hand) . Trophic changes showed glossy mottled skin with hyperkeratosis. Hampered hand showed diffusely increased activity in the involved radial and ulnocarpal joints, intercarpal joints, carpometacarpal joints, metacarpal phalangeal areas and juxta-articular regions of the digits.

Fig. 1. a and b: **hand of patient with RSD. Note swelling and glossy mottled skin. Face of the patient showing psychological illness anxiety, depressed, suffering, behavioral illness, failure to cope, fear.**

***Fig.2*. sensory system evaluation (palmar aspect of hand) patient presented extreme sensitivity to pain (hyperalgesia).**

FUNCTIONAL REHABILITATION WITH PHYSIOTHERAPY

The primary objective of physiotherapeutic modalities was goal-oriented functional restoration. The algorithm for physiotherapy was divided into four general steps that should be customized to individual needs: i) desensitization of the affected region. ii) Mobilization of the affected joints, edema control. iii) Stress loading, range of motion, aerobic conditioning. iv) Vocational and functional rehabilitation as well as ergonomic reconditioning.

1) Desentization of the affected area:

Gentle Massage: Initiated with gentle massage and touching, and gradually worked into the more sensitive area.

Different Textures: Initiated with softer materials like wool, and progressed to rougher materials like wool or texture and fabrics like velcro.

Stimuli for short period of time: Patient is advised to apply stimuli (cotton) for short period of time, frequently throughout the day.

2) Wrist and Hand Mobilisation:

Basically this technique restores normal joints range of motion and facilitates hand function. MCP/IP distraction promoted general joint play and also promoted MCP flexion and IP extension. Radiocarpal Joint-Ulnar and Radial Glide, ulnar glide increased radial deviation and radial glide gradually increased ulnar deviation. Distal Radioulnar Joint Mobilisation increased joint play and promoted greater extent of pronation and supination of the targated joint. Dorsal-Palmar Glide At Radiocarpal Joint this technique involved moving row of carpal bones either dorsally to promote wrist extension or palmar to promote wrist flexion. To Ensure Patient's well-being specific Range of Motion Exercises were also explained to him to maintain integrity of the joint such as wrist extension, wrist flexion, wrist curls etc. specifically performed twice in a day 20-25 repetitions of each exercise.

DISCUSSION

Desensitization Of The Affected Area

People with Complex Regional pain syndrome may exhibit abnormal sensation throughout all or part of the affected area. This often includes increased sensitivity to stimuli such as touch, pressure, or temperature. Desensitization can be an effective way to treat hypersensitivity, especially when used in combination with other medical and/or therapeutic interventions.

Desensitization is a treatment technique used to modify how sensitive an area is to particular stimuli. This technique is utilized to decrease, or normalize, the body's response to particular sensations. It is consistent stimulus to the

affected area for short periods of time, frequently throughout the day. These small bursts of therapeutic activity shower the brain with sensory input. The brain responds to this demand by acclimating to the sensation, thereby gradually decreasing the body's pain response to the particular stimuli. The body gets used to the stimulus and the stimuli becomes tolerable and no longer elicits the maximal pain response. It involves application of "unpleasant" stimuli to the hypersensitive area. These stimuli are the one that the body is routinely exposed to and do not elicit a painful response when presented to non-affected areas of the body, thus they are not harmful or damaging. The items used for desensitization vary, depending on what the affected area interprets as painful. Stimuli may consist of different textures/fabrics, light or deep pressure, vibration, tapping, heat or cold.

Mobility exercises showed greater impact on patient's affected joint, patient initiated doing all his activities of daily living with less pain and discomfort. Reinforcement of Desentization and other physiotherapeutic interventions showed a greater impact on patient overall well-being, patient enthusiastically joined his profession after getting recovered.

CONCLUSION

In general, progression through physiotherapy will require concurrent application of psychological and pharmacological applications. Despite the widespread conviction that physiotherapeutic modalities are beneficial for patients with CPRS, the effect of physiotherapy on the natural course of disease is yet unknown. Inspite of all this from this case it has been concluded that physical therapy can change patient's quality of living if sessions are driven with proper dedication and consistency.

Declaration by Authors

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