A Discussion on Clinical Management of Pain with Examples of Classical Formualtions

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International Association for the Study of Pain (IASP) taxonomy has defined pain as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage[1]'. In consequence, the perception of pain and its threshold are the result of complex interactions between sensory, emotional, and behavioral factors.[2] Inflammation and nerve injury can reduce pain thresholds and increase sensitivity to sensory stimuli.[5]

Pain is more than just a physiological event. It's a dynamic process that challenges a continuous interaction between complex systems. Pain perception can be modulated or adjusted according to the emotional behavior of the subject, focusing on the pain leads to higher pain intensity, while positive thinking relieves some of the pain.[4] Also, in certain cases (such as chronic back pain), physical exercise contributes to an increase of pain tolerance (and a decrease of anxiety/depression that often goes with the Pain).[3] Pain decreases when sweet fragrances are perceived or during exercises such as meditation or hypnosis.

Nociception is the conscious perception of pain that has mechanical, thermal or chemical origin. Nociceptors are peripheral receptors. They represent the end segment of the unmyelinated and myelinated dendrites of sensitive neurons that make a cutaneous nerve. The nociceptive information can be inhibited by stimulation of the opioid receptors found at presynaptic level in primary afferent neurons. The sensory signals that enter at spinal cord level inhibit the nociceptive signals through a non-opioid gate mechanism. The descendant systems also modulate the pain sensitivity in the spinal cord. Acute stress can lead to analgesia by means of an opioid mechanism, as well as by a non-opioid mechanism. The pain sensitivity control is influenced by learning (biofeedback techniques and social factors) and can be altered in depression, manic disorders and schizophrenia.There are a number of stimuli that can determine a painful sensation:

The birth of pain and its perception happen during a series of three stages[6] as:

1. Peripheral stage: Peripheral tissue sensitization
2. Transmission stage: By specialized structures
3. Integration of pain: Can be conscious or not and involves functions such as attention, concentration, memory etc.

The *peripheral stage* involves tissue damage due to mechanical, thermal or chemical stimuli, followed by a release of pain-inducing substances and stimulation of the nociceptors. Whereas the *transmission stage* involves the following:

a. Peripheral receptors
b. Nervous tracts
c. Spinal mechanisms
d. Ascending and descending pathways
e. The brainstem
f. Thalamus and the cortex

In 1999, Melzack and Wall came up with a theory of pain. This "new" theory well known as 'the neuromatrix theory', stipulates that every human being has an innate network of neurons that they named the "body-self neuromatrix." Each person's matrix of neurons is unique and is affected by all facets of the person's physical, psych

-ological, and cognitive traits, and also by their experience. In pain transmission in the dorsal horn, the neurotransmitters are released after the activation of afferent fibers of neurons that are localized in the posterior horn.

The Rolando gelatinous substance is one of the most dense reception areas. A number of substances exhibit a stimulating or an inhibitory response at the dorsal horn level as:

Stimulant	Inhibitory
Substance P	Enkephalins
CGRP	Somatostatin
Glutamate	Noradrenaline
Nitric oxide	Serotonin
Aspartate	GABA

So, number of phenomenon influences the pain transmission as:

1. Wind-up phenomenon: A progressive increase of the duration and amplitude of the action potentials in the neurons of the dorsal horn occurs after a repetitive and constant stimulation of C fibers. It is responsible of secondary pain.
2. Temporal summation: It is a physical and mental correlation of the amplification phenomenon due to the stimulation of the high threshold C or Aä fibers. Clinically, this leads to hyperalgesia or secondary pain.
3. Central hypersensitivation: It is the pathophysiological mechanism of chronic pain.

The *Integration Stage* involves structures such as:

a. Brainstem
b. Thalamus
c. Hypothalamus
d. Subcortical nuclei and,
e. Brain cortex

These are responsible for flexion reflexes, immune, endocrine, respiratory, vegetative responses, pain sensation and its perception, affective and behavioral reactions, pain learning and memory. The pain control depends on the gate system and on the thalamus. The areas that become activated during simple nociception are the somatosensory cortex (S1, S2), the anterior cingulate cortex and the insular cortex.[8]

While understanding the purpose or function of pain, it is seen that a withdrawal reflex response to an acute noxious stimulus is an understandable and necessary reaction has an obvious protective function even in the absence of conscious perception. More importantly, the *experience* of pain may lead to the avoidance of potentially harmful situations and possible injury. Immobility and withdrawal due to pain may serve to provide an environment in which healing and restoration of function can occur. The severe deformities developed by individuals with a rare congenital insensitivity to pain illustrate the useful protective function provided by the sensation of pain.

Chronic pain such as that following nerve injury, the pain associated with migraine, or where pain persists after healing of injury appears to serve no protective or restorative purpose; indeed, the pain itself becomes a disease process. Such chronic pain states are most difficult to treat. This appears to be related to the pathophysiologic processes that occur following inflammation and nerve injury, which are quite different from those seen following acute 'physiologic' pain.

So when a patient of pain is being treated, it is very important to understand the cause of pain and the type

of pain. Acharya Charaka has stated about management of neuro muscular disorders in a chikitsa sutra. The vikruta and vimarga gatavata produce the roga according to its sthana and karma.[2] According to Ayurveda while treating the vata vyadhi one has to consider the different anatomical regions and symptoms of the disease.

In Charak Samhita different lines of treatment for ailments in different body parts are clearly mentioned and accordingly holistic approaches are adopted at Shri Swami Samartha Ayurveda Chikitsalaya, Hubli for treating the patients. All the symptoms of the patients are noted well and according to the group of symptoms, appropriate medicine is prescribed to patients. In course of unavailability of medicine in market, such medicines are prepared by Vaidyas themselves from this hospital under strict mentioning of classical texts only. In some patients at Shri Swami Samartha Ayurveda Chikitsalaya, Hubli, no actual nociceptive damage was seen. The pain did not appear to be by nerve injury. In such cases the main reason for pain was in the CNS. The integration function of pain was affected.

Amrutadya taila of mentioned with Charaka Chikitsa is indicated for Ksheena veerya, agni, bala, manoroga, unmada, apasmara and arati nashaka. As all the indications were from CNS, this Amrutadya taila were used in those conditions of brain associated with pain.

The Brihad Vata Chintamani of Rasaraja Sundara is indicated in mahavata, apatantraka, shunyata, samastaprakar jwar, 16 types of sannipat, sheeta, sweda, shwasa, prabal kapha, pralapa, atinidra, romharsha and aruchi. This formulation was being used in patients with depression, excessive sleep and drowsiness. If the patient is depressed, the integration of pain in CNS will be affected. Usually in chronic pain conditions, the patients have reduced sleep because of pain. But this formulation is specially indicated in depression, pain and excessive sleep. After application of this formulation, it was found to reduce depression symptoms as well as excessive sleepiness.

The Kalyanavaleha of Yoga Ratnakara is stated for the indications viz., swara becomes megha saman, swara becomes kokil saman, jadata, gadgata and mukatwa nashaka. This was tried in speech disorders caused by disorders of CNS with encouraging results. This was also tried in children of delayed milestones with encouraging results.

The Saraswata Ghrita of Vanga Sena, Vatavayadhikara is indicated in jadata, gadgad shabda, mookata, smruti, mati and pratibha vruddikarakai. This was tried in ocular *myasthenia gravis* with promising results. This was also tried in Alzheimer's disease, results of which were awaited.

The Pakshaghatari Guggulu has very much encouraging results in hemiplegia. In some pain disorders where patient's satva (manasika bala) is excellent and there is no nociceptive damage, the pathology is suspected in conduction system.

The Triphaladya Churna of Gada Nigraha is indicated in Supti. This powder was tried in diabetic neuropathy patients with excellent results.

Kusumbadya Taila of Gada Nigraha Tailadhikara is indicated in ardit, karnashool, darun shirshool, grudrasi, vatarakta, pakshaghat, hasta, pada, greeva daha, yoni and guda pida, suptivat, astibhanga nashaka. This taila was used in cases of suspected nerve damage in sciatica, as most of the symptoms indicated towards neuropathy like symptoms. Excellent results were obtained in Vataja Gridhrasi and Pudendal neuralgia.

In nociceptive damage, Ayurveda states different formulations for different body parts and in different disease conditions. In elderly and malnourished people, tissue repair is difficultly achieved. If tissue repair is delayed, there will be continuous inflammation and associated pain.

Siddharthaka Taila of Bhaishajya Ratnavali Vata vyadhi is indicated in Sandhivata in aged patients. It is also indicated in anga sankocha, kubja, pangu and pada vivhalata. The other indication is bala pustikaraka. So, Siddarthaka taila is being used in Swami Samartha Hospital in elderly osteoarthritis patients, where strength of patients is reduced and

they have associated muscular stiffness and atrophy. Panguta and kubjata may occur in muscular and tendinous atropy. This was found to increase strength in elderly patients. It also reduced stiffness and increased range of motion apart from reducing pain.

Ayurveda also has number of formulations by which muscular strength of patients increases. This increased strength can increase pain tolerance. Ashwagandha paka of Yoga Tarangini is indicated for vatajrog, pusti, gudastitvayu, astibhang, shotha, darun sandivata, bramhana, hrudrog, gulma, arsh, shwasa, kasa, prameha and atyant vajikarak. This formulation is used in mentioned hospital with patients having good appetite and reduced strength. It was found to increase strength of patients apart from reducing pain. When this formulation was given in people with reduced appetite, it was found that they were not able to digest this. However, the person's sexual performance was reported improved.

If the patient was having reduced appetite, the Ashwagandha paka and Siddharthaka taila produced symptoms of ajeerna. In this case, some putikaraka yoga was given to increase appetite.

Kubera Paka of Brihad Nighantu Ratnakara Shuladhikara is indicated in vatavyadi, agnimandya, balakshay, prameha, mootrakruchu, ashmari, gulma, pandu, peenas, grahanivikar, atisar, aruchi, kamashakti, dhatuvardhaka, kanti, pusti and balakarak. This is being used in patients with reduced strength, reduced appetite and some GI motility disorders. The appetite and strength of patients were observed increased.

When the patient was having constipation, a formulation was selected with indication to reduce the constipation and also indicated in vatavyadhi. The Erandapaka of Yoga Ratnakara is indicated for vatavyadhi, shoola, shotha, vruddhiroga, udara, anaha, basti shoola, gulma, amavata, katigraha, urugraha and hanustambha. In mentioned hospital, it is used in patients of neuromuscular disorders associated with constipation, various types of pains in abdomen and disorders of auto immune pathology.

In Ayurveda, two types of Gridhrasi is told as vataja and vata kaphaja. In vataja gridhrasi, Kusumbadya taila while in vata kaphaja Gridhrasi Moolakadya taila are indicated. The Moolakadya taila of Gada nigraha is indicated for vatakaphaj roga, vradma, grudrasi, panguta, khanjata, apatanak, katistambha, urustambha, shosha, prakampan, vataj gulma, varna and agni vruddikaraka.

Brihat Saindhavadya taila of Bhaishajaya Ratnavali Amavatadhikara is indicated in amavat, krumi, gulma, plihodar, shira peeda, agnimandya, pakshaghat, sandivat, andagat vata, urustambhadi roga nashaka. This was tried in an auto immune disease of carotid artery which lead to cerebral ischemia and hemiplegia. The result was very much encouraging.

Hinguladya Guggulu is indicated in daruna sandhivata. The ingredients of Hinguladya Guggulu are shuddha Hingula, shuddha Guggulu and suddha Gola. Both Guggulu and Gola are established analgesic and anti inflammatory. So, it was used in potential tissue damage. It was found that this formulation has marked anti-inflammatory and analgesic activity.

Hence, it can be said that according to symptoms observed critically, Ayurvedic medicines give excellent result in pain, if prescribed appropriately.

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