

ROLE OF NERVE BLOCKS IN CHRONIC PAIN MANAGEMENT

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Introduction

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage¹.

Chronic pain is difficult to treat and often the interventions fail. This failure is, in part due to the fact that chronic pains usually result as a manifestation of some chronic degenerative, inflammatory or neoplastic process. As far as the choice of interventions is concerned, the indication for its use may not be well justified, and the choice itself may be determined by the type of specialist and not by the actual clinical picture. The various treatment interventions usually fail due to non-compliance of patients towards the untoward side effect of the systemically used drugs. The patient may not receive the treatment for appropriate time and dosage due to the side effects. Furthermore, indication of specific treatment modality depends upon the evidence of positive effects of the modality, as indicated in various control trials or the related literature².

Many clinicians use pharmacologic agents to manage chronic pain. These include NSAIDs, opioids, muscle relaxants, membrane stabilizing agents (local anesthetics), antiepileptics, antidepressants, calcium channel blockers etc. These pharmacologic agents may prove helpful in relieving one type of chronic pain but not the others (e.g. anti-depressants and antiepileptics are helpful in neuropathic pain as opposed to opioids which are usually least/ not effective for neuropathies). Similarly NSAIDs are promising especially in inflammatory lesions. In this instance regional nerve blocks using local anesthetics alone or in combination with steroids provide better compliance and lesser side effects in various chronic painful conditions.

Clinical Implications of Neural Blockade

Local anaesthetic agents are the basic pharmacologic tools for neural blockade. As already has been mentioned, these can be used in conjunction with steroids, opioids or other drugs, or non-pharmacologic techniques like cryoanalgesia and TENS depending upon the type of chronic painful condition. Neural blockade may be diagnostic, prognostic, prophylactic or therapeutic. All these interventions carry their own merits and demerits or risk/ benefit ratio. Therefore, an attempt should be made to maximize information from diagnostic or prognostic blocks before using therapeutic blocks with a high rate of morbidity³.

Drugs used and their basic Molecular Mechanism

Pharmacologically active agents used for blockade are local anesthetics, steroids and glycerol plus neurolytic solutions such as alcohol or phenol. In common

these agents prevent neuronal transmission through nerve fibres either by blocking membrane ion channels or by protein denaturation of axons. Former is the mechanism of local anaesthetics while alcohol and phenol act by the latter one. Difference lies between the duration of protein denaturation by alcohol or phenol. The fibres injected with phenol, regenerate and both sensory as well as motor fibres are affected non-selectively. Phenol blocks are regarded as permanent ones. In contrast, alcohol produces neuritis and a more prolonged non-selective blockade of fibres. Its clinical implication is especially in the celiac plexus block where large volumes of phenol may not be safe. Glycerol and corticosteroids suppress the neuroma activity. In addition, steroids also suppress inflammatory mediators from damaged tissue thus causing analgesia.

Physical methods of Neural Blockade

In addition to pharmacologic agents, various physical methods are also used to produce neural blockade in chronic painful conditions. Cryoleisioning destroys the nerve fibres by coagulation at very low temperatures (-4°C). Dysesthesia may arise as a complication in this technique. Radiofrequency thermocoagulation destroys the nerve fibres at very high temperatures.

How neural blockade is helpful in Chronic Pain Management

Nerve blocks reversibly interfere with neuronal transmission. This leads to temporary relief in the pain. As a result muscle spasm vanishes and range of mobility is increased. This facilitates physical therapy and rehabilitation. This is how the local nerve blocks break up the pain cycle and aid up in the relief of pain symptoms.

Diagnostic Blocks

Despite a high rate of false positive and false negative results in some studies⁴, diagnostic blocks must be used and interpreted with great caution. These can be very helpful in making diagnosis e.g. facet joint pain⁵. Intravenously administered α -adrenergic blocker phentolamine has been suggested as a test of sympathetic involvement in chronic pain and as a predictor of outcome of sympathetic neural blockade^{6,7}.

Prognostic Blocks

The blocks are advocated as a means of determining whether neuroablative procedure will be effective and acceptable to the patient. Usually there is need of more than one prognostic block to be performed with a consistent outcome.

Prophylactic Blocks

Specially helpful in decreasing the incidence of phantom limb pain, these blocks may be helpful if applied at appropriate time i.e. pre emptive blocks.

Therapeutic Blocks

Once diagnosis of chronic pain has been made it is easier to apply the definite therapeutic blocks. Local anesthetics, opioids or other drugs can be given depending upon the site involved. e.g. trigger point injections, blocks for nerve entrapment syndromes, cranial nerve blocks, tendon injections, intra-articular steroids for shoulder, knee and hip pain; paravertebral and inter-pleural blocks. Intraventions used for chronic backache are epidural steroids, facet joint and nerve root injections. Dorsal root ganglia, radiofrequency low energy laser therapy and acupuncture are the methods to relieve chronic back pain. Sympathetic nerve blocks have been implicated for the pain that is thought to have a “ sympathetic component”, visceral pain and pain due to vascular insufficiency. In this regard celiac plexus, lumbar sympathetic, ganglion impar blocks have been successful. I/V regional sympathetic blocks with various drugs like labetalol, mehtyldopa, ketamine, hydralazine, clonidine, and droperidol have all been performed.

Conclusion

An intergrated biopsychosocial approach is more appropriate for patients with chronic pain. Multimodal therapy involving nerve blocks and non- pharmagologic techniques like acupuncture, physical therapy, rehabilitation and psychologic training of patients is needed to treat chronic pains.

References:

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