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Treatment of Acute Cervical and Lumbar Pain

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Abstract

The main goals of this chapter are to keep in mind the natural evolution of this pathology and the high rate of spontaneous recovery without any clinical intervention. Learn to always select, as far as possible, the most conservative and least invasive options, without forgetting the importance of patient education. If the use of specific analgesic medication is considered necessary, individualize the treatment, always bearing in mind the patient's previous pathology and the side effects and interactions of the drug that we are going to use. And be aware of the availability of minimally invasive analgesic techniques for selected cases in which pain and functional limitation are more severe.

Keywords: acute cervical; lumbar pain; neck pain; muscle relaxants

Introduction

The natural history of both acute lumbar and neck pain, in the absence of a tumor lesion or other severe disease process, is characterized by a rapid relief of symptoms in no more than 6 or 8 weeks [1,2]. In most cases in which clinical intervention is necessary, the episode is resolved with conservative measures, which include: educational therapy, mild physical exercise, local heat, and first-rate analgesics (non-steroidal anti-inflammatory drugs–NSAIDs– and/or muscle relaxants). Only on rare occasions will it be necessary to resort to opioid treatment. Hospital admission is reserved for patients with severe pain who do not respond to previous measures or when there is spinal cord or cauda equina involvement.

Non-pharmacological treatment

The initial treatment of acute low back pain or neck pain that does not have a neurological deficit or suspicion of infection or tumor begins at the Primary Care level.

Patient Education

It is an essential part of the treatment. The patient must be informed from the beginning of the generally favorable evolution of his process, whether or not it includes neurological symptoms, and of the high probability that he will experience a considerable improvement during the first month [1, 2]. It is also convenient to advise the patient to remain active, avoiding bed rest as much as possible [3, 4]. It can be an unavoidable consequence of the pain if it is intense and disabling, but it is not a treatment, so it is generally not recommended. The patient should resume their usual physical activity as soon as possible. Prolonged incapacity for work stimulates the negative perception that the patient has of his illness. It is also important to stress the importance of proper weight control and good postural hygiene: avoid repeated bending and rotation of the trunk, not lifting heavy objects, facilitating frequent position changes, or sitting in a chair with good lumbar support.

Local Heat

There is moderate evidence that superficial local heat, applied several times a day, improves pain and functionality compared to placebo [1, 6].

Physical Exercise

Physical exercise also improves pain and functionality. The latest studies show that it provides more beneficial than harmful effects, which is why it is recommended, although with a low level of evidence, surely due to the heterogeneity of the studies [3, 6]. In general, supervised exercises to strengthen the muscles of the trunk and extremities, flexibility, and aerobic reconditioning are usually recommended 1 or 2 weeks after the onset of the symptoms and when the pain allows it. The patient may begin initially with low-impact aerobics activities, such as walking,

cycling, or swimming, and then gradually and carefully resume high-impact activities after the acute episode is over.

Manual Therapy

Manual therapy is a physical treatment directed at different structures of the musculoskeletal system. The purpose of manual therapy is to increase the range of motion, improve elasticity, enhance relaxation, modulate pain, and reduce inflammation. Manual therapy includes a wide variety of different techniques, such as manipulation, mobilization or traction, and soft tissue (massage) techniques. Recent systematic reviews and multiple clinical guidelines recommend manual therapy, both for acute cervical and lumbar pain, in combination with other treatments. It is generally recommended to associate some type of manual therapy with a good program of directed exercises, personalizing the treatment in each case [3, 6-8]. In the event that neuropathic symptoms predominate, the available literature recommends a multimodal approach with a predominant component of traction for the treatment of cervical radicular pain, and a multimodal approach with a component of traction, axial mobilizations, and aerobic exercise for pain. lumbar root [9].

Other Therapies

With little and variable degree of evidence, according to the studies consulted, there are other therapies, such as the use of fixation orthoses [10], acupuncture [11, 12] laser treatments, electrotherapy, etc. Since treatments are combined in most cases, it is difficult to determine the isolated benefit of each of these interventions.

Pharmacotherapy

The aim of treating patients with acute cervical and lumbar pain is early symptom control. Inadequately managed acute pain has a negative impact on numerous aspects of a patient's health and can increase the risk of developing chronic pain. The primary care physician is often faced with challenging acute pain scenarios and key decision dilemmas regarding the selection of medications to provide adequate pain relief. The primary purpose of treatment is to facilitate recovery, improve function and quality of life, and minimize both adverse effects and the need to prescribe opioids. Although in most cases the natural evolution in the short term is usually favorable without any medical intervention, sometimes it is necessary to introduce some type of analgesic medication to the treatment, especially in those cases in which the pain and functional disability are more severe. severe. In these cases, most of the most recent clinical guidelines consider NSAIDs and muscle relaxants as first-line treatments [1, 4, 13].

Paracetamol

According to the latest studies, there is no evidence that paracetamol improves either pain or functionality in cases of acute low back pain, which is why most clinical guidelines advise against this medication1 [3, 14]. In the case of acute neck pain, there are recent guidelines that recommend it, although with a low level of evidence [6].

Non-Steroid Anti-Inflammatory

NSAIDs are a heterogeneous group of drugs. Due to their anti-inflammatory, analgesic and antipyretic action, they are among the pharmacological groups that are most consumed worldwide, with or without a medical prescription, for the treatment of acute and chronic pain. In Spain, the most widely used drug is ibuprofen, followed by naproxen15, although none has demonstrated therapeutic superiority over the others, and there is also great variability in the analgesic response obtained from one patient to another. They are drugs that have an analgesic ceiling, so if the maximum doses of one, in particular, do not obtain the expected benefits, we can change to another, always taking into account the individual risk factors of each patient. The World Health Organization (WHO) introduced the analgesic scale for cancer pain in 2008 [16], which was later extended to non-malignant chronic pain. In this analgesic scale, NSAIDs are included in the first step as the main option for pain management and as adjuvants to weak or strong opioids in the second and third steps, respectively.

Due to its mechanism of action and its side effects, this group of drugs should be used with caution, at the lowest possible dose and for short periods of time [17, 18]. All NSAIDs act on the metabolism of arachidonic acid, released from tissue damage, blocking the enzyme cyclooxygenase (COX) and inhibiting the synthesis of eicosanoids (prostaglandins, thromboxane's and prostacyclins). This action is the key to both its therapeutic effects and its adverse reactions. Although they all block

COX, the degree of inhibition of each of them (COX-1 or constitutive and COX-2 or proinflammatory) varies among members of the group. This has popularized the classification of NSAIDs between the COX-2 selective or coxibs and the non-selective or traditional NSAIDs. The analgesic and anti-inflammatory effects of all NSAIDs depend on COX-2 inhibition and are not related to enzyme selectivity. Among the non-selective NSAIDs, ibuprofen deserves special mention, since it was the first non-steroidal anti-inflammatory drug, excluding acetylsalicylic acid, approved for over-the-counter use, and it is widely considered the best tolerated drug in its class [19]. It is an NSAID derived from 2-aryl-propionic acid and non-selective inhibitor of the biosynthesis of prostaglandins derived from cyclooxygenase 1 (COX-1) and 2 (COX-2). It is metabolized by the liver and eliminated by the kidneys. Preparations are currently available on the market in which the bioavailability of ibuprofen is increased by salification with various salts, in particular L-arginine (ibuprofen arginate), which, in addition, could reduce the gastrointestinal side effects of ibuprofen, as it is substrate of the nitric oxide (NO) synthesizing enzyme, NO synthetases [20-22].

Naproxen is another of the best tolerated NSAIDs. It can be used as an antipyretic and analgesic, its effect is similar to that of acetylsalicylic acid, but with better tolerance. It has, like ibuprofen, hepatic metabolism and renal elimination. Its elimination half-life is 14 hours, and in the elderly, it doubles, so the doses must be adjusted.

Metamizol, a pyrazalone derivative with an analgesic, antipyretic and spasmolytic effect, is the most widely used non-opioid analgesic after paracetamol. It acts as an inhibitor of prostaglandin synthesis by inhibiting the COX enzyme, both 1 and 2. The inhibition is competitive and reversible, and therefore has hardly any effects at the gastrointestinal level, except in very high doses. It has central and peripheral actions, and a very weak anti-inflammatory effect. Due to the risk of agranulocytosis associated with the use of this drug, it was withdrawn from the pharmaceutical market in some countries, although it continues to be marketed in countries of Central and South America, Europe, Africa, and Asia. After multiple studies, the Spanish Agency for Medicines and Health Products (AEMPS) considers that metamizole is a safe and effective medication, with a favorable risk/benefit ratio, as long as it is used under medical supervision and prescription, using the lowest possible dose. and for short periods of time, and avoiding its prescription in patients with a higher risk of suffering from agranulocytosis.

Selective NSAIDs include etoricoxib, celecoxib and meloxicam. While the latter is considered a "preferential" inhibitor of COX-2, because it has a 5- to 7-fold greater affinity for this isoenzyme, both etoricoxib and celecoxib are considered "selective" inhibitors, since they its affinity for COX-2 is 375 times higher. Although the gastrointestinal tolerance of these drugs is usually better than with classic NSAIDs, recent studies show that they do have effects at this level, and the risk increases with the concomitant administration of antiplatelet drugs and/or anticoagulants [23, 24]. The increased cardiovascular risk associated with these drugs was revealed as a result of the results obtained in the APPROVE study [25] and the VIGOR trial (year 2000, rofecoxib vs. naproxen in patients with rheumatoid arthritis) [26], trial that led to the withdrawal of rofecoxib from the market. However, since then a multitude of studies, reviews, and meta-analyses have been carried out that question the advantage of classic NSAIDs over coxibs in patients with underlying cardiovascular disease. There do not appear to be any differences between selective and non-selective NSAIDs in terms of short-term pain relief [13, 27].

Topical NSAIDs

The topical application of diclofenac has been shown to be more effective than placebo in reducing pain and improving functionality in patients with acute neck pain, but not in those with acute low back pain [6, 28].

Side effects

Above all, it must be taken into account that NSAIDs are considered inappropriate drugs in 25% of patients and in 50% of patients older than 65 years; the probability that the prescription is inappropriate in this group of patients is five times greater. NSAIDs are associated with **cardiovascular side effects** that increase systolic and diastolic blood pressure, which can precipitate cardiovascular events. It is important to take into account that hypertensive patients on antihypertensive treatment who take NSAIDs may see the efficacy of their medication diminished due to pharmacodynamic interactions with these drugs (especially with angiotensin-converting enzyme inhibitors, diuretics, beta-blockers and angiotensin blockers). angiotensin receptors) [29, 30]. They have

also been associated with an increased risk of heart failure, especially in patients with pre-existing heart failure, and severe thrombotic events, such as acute myocardial infarction and cerebrovascular accidents [31, 32]. It seems proven that the increased risk of cardiovascular events is related to the degree of selectivity for COX-2 and the degree of inhibition of the enzyme, with a clear dose-dependent relationship [33]. Although both naproxen and ibuprofen are considered by many studies to be the NSAIDs with the best cardiovascular safety profile, they also have the potential to decrease the cardioprotective effect of aspirin [34-36].

Gastrointestinal complications are well-recognized side effects of NSAIDs and are mainly due to COX-1 blockade. The most frequent effects include bothersome symptoms with or without mucosal damage, asymptomatic mucosal lesions and other more serious complications, which can even cause death. It has been shown that around 30-50% of NSAID users have endoscopic lesions (erosions, subepithelial hemorrhages, ulcerations) located mainly in the gastric antrum and often without clinical manifestations. On the contrary, up to 40% of NSAID users present symptoms, the most frequent being gastroesophageal reflux disease and dyspepsia [26, 37, 38]. The use of NSAIDs has also been associated with kidney damage, especially when used at high doses. Recent studies have shown that greater COX-2 specificity is associated with a lower risk of acute kidney injury [39, 40]. The risk of hepatotoxicity associated with NSAIDs is significantly increased in patients with previous liver disease. Multiple studies have reported clinically significant hepatotoxicity, with diclofenac showing the highest proportion of hepatotoxic events, followed by celecoxib and etoricoxib [41]. It is important to stress that the latest clinical guidelines recommend avoiding NSAIDs in patients with cardiovascular disease, chronic kidney disease, high blood pressure, heart failure, and cirrhosis, recommending special caution if NSAID prescription is necessary. Given the different risk profiles of patients and the differences between drugs, it is necessary to individualize their use based on the type of process for which they are used and the characteristics of the patient.

Muscle relaxants

There is moderate evidence that treatment with muscle relaxants in acute neck pain and low back pain improves pain in the short term, but has no effect on functionality [1, 2, 4]. Muscle relaxants are a group of drugs with different mechanisms of action that decrease the tone of striated muscles. They can be classified into antispasmodic drugs (cyclobenzaprine, tizanidine), antispastic drugs (baclofen, dantrolene), and benzodiazepines (diazepam). Tizanidine is a centrally acting muscle relaxant through its alpha-2 adrenergic agonist effect. It is believed to inhibit the release of nociceptive excitatory amino acids (aspartate, glutamate, and substance P) by suppressing polysynaptic excitation of pain-transmitting interneurons in the spinal cord. Tizanidine has evidence to suggest that it may be particularly helpful in managing low back and cervical myofascial pain.

Cyclobenzaprine is probably the most commonly used muscle relaxant. It has a three-ring molecular structure similar to tricyclic antidepressants, which is why it also shares their side effects, mainly anticholinergics (dry mouth, metallic taste, constipation, urinary retention, blurred vision, palpitations, and tachycardia). and sedation. In regarding its therapeutic effects, they are centrally mediated and have no direct peripheral action. Its exact mechanism of action is unknown, but it has the property of increasing norepinephrine, similar to tricyclic antidepressants. In a systematic review, it was concluded that cyclobenzaprine has a greater effect than placebo in relieving acute pain, although probably with little clinical relevance [42, 43]. There are few studies that explore its long-term efficacy [44]. There is no clear evidence indicating superiority/effectiveness between one muscle relaxant or another, so the choice of drug should be based on the profile of possible side effects, physician and patient preferences, potential for abuse, and possible drug interactions. Both cyclobenzaprine and tizanidine may be a reasonable option based on the evidence available to date. Muscle relaxants should be used for a short period of time (maximum 2 weeks) for acute cervical or lumbar pain [45, 46].

Opioids

Although there is much controversy regarding the use of these drugs in acute cervical and lumbar pain, they may have a role in selected patients with severe pain, especially in those who present a disabling neuropathic component and significant functional limitation that does not improve with the measures previous [47, 48]. They are classified into minor opioids (tramadol, codeine, dihydrocodeine) and

major ones (buprenorphine, tapentadol, morphine, hydromorphone, fentanyl, oxycodone, etc.).

In principle, it is recommended to start treatment with minor opioids and escalate the dose and potency depending on the response. Tramadol can be a good starting point. It exerts its analgesic effect by acting as a selective inhibitor of norepinephrine and serotonin reuptake, and by binding to opioid receptors. Major opioids should be reserved for cases of severe pain and, whenever possible, for short periods of time, to avoid the multiple side effects associated with these drugs. The most common include nausea, vomiting, dizziness, drowsiness, and constipation, but there are others that are even more worrisome, including the appearance of opioid-induced hyperalgesia and serious tolerance and dependency problems with progressive dose increases [49, 50].

Corticosteroids

Systemic corticosteroids are used to treat the acute condition, mainly when there is low back or neck pain with a severe neuropathic component. They improve pain, but above all functionality.

There does not appear to be any evidence in the treatment of acute low back pain and neck pain without a neuropathic component [51, 52].

Interventional Management

Fundamentally reserved for patients who debut with severe and disabling symptoms that require early hospital care. Frequently, these are patients with predominant radicular pain, which may or may not be accompanied by objectifiable sensory and/or motor deficits (radiculopathy). The symptoms caused by this pathology are an important cause of disability and morbidity, as well as work absenteeism, with the consequent economic impact on health resources and other social costs [53, 54]. The most frequently performed techniques in patients admitted to the emergency room due to neck pain and acute low back pain are epidural blocks with corticosteroids (cervical and lumbar) and, less frequently, facet blocks (lumbar). In all these cases, it is highly recommended to previously perform some type of imaging test: nuclear magnetic resonance (NMR) or computerized axial tomography (CT).

Lumbar epidural blocks

Epidural corticosteroid injection is one of the most widely used interventional techniques in Pain Units for the treatment of lumbar radicular pain. It consists of administering a mixture of corticosteroids and local anesthetics directly into the posterior epidural space (interlaminar approach) [55] or into the affected root area (transforaminal approach) [56, 57]. In some centers it continues to be performed using the "blind" technique, although it is most recommendable to perform it under radioscopic control. Epidural corticosteroids are administered due to their anti-inflammatory effect, mainly mediated by the inhibition of phospholipase A2. They also act by stabilizing the membrane, prolonging the inhibition of neuronal firing in C fibers, and suppressing neuronal sensitization of the dorsal horn of the spinal cord [58, 59]. The current recommendation is the use of non-particulate corticosteroids via the epidural route, since they have demonstrated similar clinical efficacy with fewer side effects (risk of spinal cord infarction secondary to accidental intravascular administration of the corticosteroid).

To this day, there is still controversy regarding the degree of efficacy of epidural corticosteroid injection, due, above all, to the great heterogeneity of the studies, in which pathologies are mixed, different combinations of drugs are used and also different techniques and approaches. That is why the level of evidence can vary significantly depending on the studies reviewed. In general, we can state that the efficacy is good with minimal adverse effects [4], especially in acute and subacute pathologies, and especially with the transforaminal epidural approach [60, 61], since this technique allows medication to be administered at the site Precisely where the pathology is.

Cervical epidural blocks

At the cervical level, epidural corticosteroid injection is only indicated in patients with persistent radicular neck pain (over 4-8 weeks of evolution) who do not respond to conservative treatment [62]. In this case, interlaminar access at the C7-T1 level is preferable, since at higher levels the epidural space is practically non-existent and the ligamentum flavum is very thin, which makes the loss-of-resistance technique difficult. Transforaminal access is discouraged due to the high probability of inadvertent vascular puncture [63, 64].

Facet blocks

They are performed much less frequently than epidural blocks for the treatment of acute low back pain, and very rarely for acute neck pain. This treatment is usually reserved for patients with chronic low back pain with eminently mechanical characteristics and no associated neuropathic

component. Also, when the episodes consist of recurrent exacerbations (cervical and lumbar) or as a diagnostic method prior to radiofrequency denervation [65].

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