

Research article

Low back pain- Algorithm of diagnosis and management

Mihaiela Chicu ¹, Madalina Ioana Matran-Dan ^{2*}, Irina Esanu ³, Liliana Mihailov ⁴, Bianca Andreea Onofrei ⁵

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- 1 Department of Pathology, Faculty of Medicine, University of Medicine and Pharmacy "Grigore T. Popa", University Street, No. 16, 700115 Iasi, Romania; mihaielabitere@yahoo.com;
- 2 Clinical Recovery Hospital, 700661 Iasi, Romania; fotachem@gmail.com;
- 3 Department of Internal Medicine, Faculty of Medicine, University of Medicine and Pharmacy "Grigore T. Popa", University Street, No. 16, 700115 Iasi, Romania; irina.esanu@umfiasi.ro;
- 4 Department of Palliative Care, Faculty of Medicine, University of Medicine and Pharmacy "Grigore T. Popa", University Street, No. 16, 700115 Iasi, Romania; lily_iasi@yahoo.com;
- 5 Faculty of Dental Medicine, University of Medicine and Pharmacy "Grigore T. Popa", University Street, No. 16, 700115 Iasi, Romania;

* Correspondence: fotachem@gmail.com

Abstract: Introduction: Low back pain is a frequent condition, associated as a symptom with a multitude of organic or non-organic pathologies, resulting in the appearance of disability generating negative economic and socio-professional consequences. Being a relatively common symptom among patients, we created this paper with the aim to highlight the importance of the clinical examination along with the correct direction of the patient to a profile department, the review of differential diagnoses, as well as the establishment of a particular recovery plan adapted to each case.

Materials and Methods: We analyzed a series of recent articles using the PubMed and the Cochrane Library data-bases, using the keywords words "low back pain" and "rehabilitation", to obtain data on the clinical and paraclinical examination, positive and differential diagnosis of chronic low back pain, as well as on rehabilitation management.

Results: Low back pain may appear due to vertebral conditions (inflammatory, infectious, traumatic, neoplastic, degenerative, metabolic), or due to extravertebral causes. Along with the anamnesis, clinical examination and imaging investigations, we establish the positive diagnosis and create an individualised rehabilitation plan. The rehabilitation protocol is divided into stages, the final goal is to minimize the ischemia-pain-contracture chain.

Conclusion: The pathology of the lumbosacral spine can be characterized by the word "diversity", being one of the causes of early disability of the population in the field of work. Our work highlights the importance of the clinical and paraclinical examination in outlining the differential diagnosis of chronic lumbar pain, as well as the role of the multidisciplinary team in complex individualized rehabilitation treatment.

Keywords: low back pain, diagnosis, management

1. Introduction

In the care of the patient with lumbar spine conditions, the medical rehabilitation doctor has the following goals: to provide compatible, adequate, and effective care to the patient for the treatment of these conditions, to demonstrate his medical knowledge of biomedical, clinical, epidemiological and socio-behavioral sciences established and in development regarding conditions of the lumbar spine and applying this knowledge to guide holistic patient care and demonstrate interpersonal and communication skills that result in effective information sharing and collaboration with low back pain patients, their families and other professionals in health field. The World Health Organization further reported that up to 70% of the population in industrialized countries will experience non-specific low back pain. Studies of epidemiological

monitoring of low back pain in the USA have reported a rising trend across age groups and in both men and women.[1,2]

Materials and Methods

Lumbar back pain has multiple etiologies, therefore we decided to exemplify the most common ones according to the literature database mentioned above.

The physical examination of the patient with lumbar back pain begins with a thorough history to ascertain the onset of pain, its character, location, and aggravating and mitigating factors. Asking about associated symptoms, such as weakness, bowel or bladder problems, fever, and abnormal weight loss, is essential. The examination includes inspection of the lower back and lower limbs.

The "gold standard" for evaluating conditions causing spinal pain is magnetic resonance imaging (MRI), which allows good visualization of discs and nerves, as well as providing valuable information needed for further management if the condition does not improve.

The treatment usually include: NSAIDs, Muscle relaxants, Opioids, Superficial thermotherapy and kinetotherapy, which should be conducted at home to prevent the further chronic episodes to occur.

Lumbar facet joints are formed by the articulation of the lower and upper facet joints of adjacent vertebrae. The synovial capsule of the facet joints receives nociceptive innervation via the medial branches of the dorsal ramus.

Lumbar radiculopathy is a pathological process involving the roots of the lumbar nerves. The prevalence of lumbar radiculopathy in the general population ranges from 2.2% to 8%, depending on the study, and the incidence ranges from 0.7% to 9.6% [1-3, 15]. The most common symptom in lumbar radiculopathy is pain, which can vary in severity and location. The most essential elements evaluating lumbar radiculopathy are the history and physical examination. Positive diagnosis has two components: one to confirm the diagnosis and the second to determine the etiology. Diagnostic studies include radiography of the lumbosacral spine, computed tomography, and magnetic resonance imaging. Electromyography and nerve conduction studies are important for the diagnosis and prognosis of lumbar radiculopathy. The goal of treatment is to reduce inflammation, relieve pain, and allow the radiculopathy to resolve regardless of the underlying anatomical abnormalities. Treatment may include nonsteroidal anti-inflammatory drugs (NSAIDs), oral corticosteroids, epidural steroid injections, or surgery.

Paravertebral lumbar contracture is classified by clinicians as an episode of acute pain felt at this level.

Patients report pain in the lumbosacral region accompanied by contracture of the paravertebral muscles. The etiology is most likely secondary to a chemical or mechanical irritation of the sensory nociceptive fibers in the intervertebral discs, the joints between the facets of the vertebrae, the sacroiliac joints, or the muscles and ligaments in the lumbosacral area. The pain develops spontaneously, after traumatic or intense events, such as: participation in certain sports, repeated bending, lifting weights, motor vehicle accidents or falls. The pain is located predominantly in the lumbosacral (axial) area at the level of the lumbar spinous processes and along the paravertebral muscles.[4,5,11]

Spondylosis represents a bone defect/pseudarthrosis from previous fractures of the bridge between the vertebral joints. It appears secondary to the accumulation of stressful/traumatic factors on the pars interarticularis in childhood (5-7 years) and adolescence in athletes, but it does not appear in infants. New cases rarely appear after the end of the skeletal maturation process, the condition being more common in males. The most affected site is L5.

Spondylolisthesis represents the slipping of one vertebra on the underlying one and it refers to the failure of the structural and functional components of the neural arch and the articular surfaces to maintain the vertebrae in their physiological position. It is characterized by 3 factors: etiology, degree, and direction of sliding.

The main symptoms are dull pain in the lumbar area, buttocks and in the area of the thighs on the back face. Aggravating factors: prolonged standing, walking, intense physical exertion (those with spondylosis report less severe symptoms with standing or sitting than those with non-specific lumbar pain).[6-8]

The diagnostic studies are: Lumbar X-ray in different incidents, CT, PET-CT, bone scintigraphy, and MRI. The prognosis is favorable following conservative treatment (modification of activity, assessment of comorbidities, physical therapy, physical therapy, orthotics), but surgical procedures or interventions can be used as alternatives in case of failure.

Lumbar spinal stenosis is a common cause of spine-related pain and disability in older adults. Lumbar spinal stenosis is a condition that involves the narrowing of the central spinal canal, lateral recess, or foramen, which leads to a reduction in the space available for neural and vascular elements and which can lead to back and leg pain, paresthesias in the lower extremity of the body, affecting walking and quality of life.

The management and clinical research of lumbar spinal stenosis is limited by the heterogeneity of the condition, the lack of standard criteria for diagnosis and study inclusion, and the high rates of anatomic stenosis in imaging studies in asymptomatic older people.

Conservative management options currently include medications, spinal surgery, and rehabilitation. However, as few high-quality randomized trials have evaluated conservative management options, systematic reviews have concluded that there is insufficient evidence to recommend any specific type of nonsurgical treatment. As the prevalence of lumbar spinal stenosis with neurogenic claudication is expected to increase exponentially, extensive, high-quality studies are needed. Surgery is helpful for patients with symptomatic spinal stenosis.[9-12]

Dysfunction of the sacroiliac joint is a frequent source of back pain.

Injury to the lumbosacral spinal cord represents the alteration/loss of motor or sensory function at this level, secondary to injury to the nerve formations in the medullary canal. Lumbosacral MS injury represents 11% of all cases of traumatic injuries of the spinal cord.

The causes are divided into traumatic and non-traumatic, the L1 level being the most affected. Patients experience the following symptoms: weakness in the lower limbs, paresthesias, bladder and intestinal dysfunctions, sexual impotence, pain and depression. The physical examination reveals, by inspection and palpation, concomitant injuries and allows the differential diagnosis between medullary cone syndrome and horse-tail syndrome depending on the neurological level of the Injury.

Clinicians usually use radiography, CT, MRI, electrodiagnosis and urodynamic studies, complementary abdominal and renovesical ultrasound for diagnosis. Central disc herniation, tumors, abscesses, infections, lumbosacral plexus injuries and peripheral nerve disorders may also cause lumbar pain.

The initial treatment is based on the stabilization of vital parameters, after which the patient enters a phased rehabilitation program aimed managing of urinary and intestinal dysfunction, pain and spasticity control and prevention of pressure ulcers. Other options are represented by procedures, electrical stimulation of the lower limbs, or surgical options. The possible complications of the disease are the following: urinary tract infections, bedsores, upper limb pain and neurological decline. Complications of the treatment include, in addition to the adverse effects of the medication, CSF leakage, infections, or chronic pain after surgical interventions.[12-15]

Lumbosacral plexopathy is an injury or involvement of one or more nerves that combine to form or branch from the lumbosacral plexus. It has been recognized as a clinical entity or complication in a variety of surgical procedures, trauma, and obstetric surgery or childbirth, and as a clinical finding or sequelae in the treatment of pelvic tumors. The lumbosacral plexus can be compressed as a complication of labor and delivery. Gynecological surgery is considered to be one of the most common causes of lumbosacral plexus nerve injuries. Both pelvic malignancies and treatment of pelvic tumors can damage the lumbosacral plexus. Diabetic lumbosacral neuropathy is a subacute, painful, asymmetric neuropathy of the lower limbs. Electrodiagnostic evaluation of lumbosacral plexopathy is one of the most effective tools available for differentiating a specific pattern of nerve involvement and measuring its severity. Potential complications of lumbosacral plexopathy include joint contractures, limited mobility, weakness, falls secondary to weakness or sensory loss, bowel or bladder incontinence, skin breakdown, sexual dysfunction, and a significant decrease in functional independence from these complications.

Arachnoiditis can occur after a variety of conditions. However, it most commonly occurs as a sequela of spinal surgery or after intrathecal injection of radiographic dyes and neurotoxic preservative chemicals. The pathophysiology includes microtrauma at the level of the arachnoid vasculature and pia mater, which can affect the control mechanisms for meningeal fibrosis and this results in the deposition of fibrous collagen bands in the arachnoid-pia mater membranes, which leads to the adhesion of the nerve roots to each other as well as to the dural sac. In severe cases, fibrosis can cause root ischemia with progressive neurological deficits. The patient has the following symptoms: pain, paresthesias, fatigue, muscle atrophy and sphincter incontinence. The clinical examination reveals an uneven distribution of peripheral motor neuron syndrome with muscle weakness, muscle atrophy, hyporeflexia, anesthesia, unstable gait and low rectal tone. In rarer cases, central motor neuron symptoms can also be found. The radiologic findings can be seen in myelography, MRI or CT myelography. The differential diagnosis of arachnoiditis include the following diseases : spondylosis, radiculopathy, horse tail syndrome, neurogenic claudication, spinal tumor, infection and meningitis. The treatment include pain medication (NSAIDs, Opioides, anticonvulsivant) and physiotherapy (heat, cryotherapy, electrical stimulations, TENS). Kinotherapy can be used for the improvement of muscle strength. Along these, the clinicians can use the following procedures : neuromodulation, administration of medicinal substances intrathecally, neuraxial injections with corticosteroids: epidural injections and blocking of nerve roots. The surgical treatment include shunt placement and excision of the calcified mass.

Results

We analysed the main treatment protocols for the rehabilitation of low back pain, summarised and exemplified a few key points, described below.

Objectives pursued by the medical rehabilitation doctor are represented by:

- Description of the critical elements of the history and physical examination of patients with lumbar pain;
- Description of Waddell's signs and their clinical utility;
- Identifying "red flags", defining deficiencies, functional limitations and participation restrictions;
- Identifying the psychosocial and vocational implications of patients with lumbar pain, and thinking of strategies to address them;
- Discussions about the implications of returning to work for patients with lumbar spine conditions;

- Discussion of anatomy and clinical correlations; epidemiology; pathophysiology; differential diagnosis; diagnostic tests, standard labs, and imaging; treatment modalities and ethical issues;
- Review of treatment options and rehabilitation components in lumbar spine conditions
- Development of a treatment and rehabilitation plan for patients with lumbar spine disorders;

Prevention of depression throughout the rehabilitation process of these patients is essential for their long-term health. Risk factor optimization and reevaluating the associated diseases are necessary for therapeutic success. Anxiety and depression have a significant impact on rehabilitation, which can be changed throughout rehabilitation. Social support also significantly influences the recovery of these patients.

Strength and Limitations

A strength of the research article lies in the combination of functional issues of everyday performance included: ADL and work ability.

By including studies from different cultural and geographical settings it is shown that low back pain is a global issue. The major limitation lies in the reviewed papers. Most of the included studies were observational non-randomized studies as well as cross-sectional studies done with relatively small samples. This fact prevents conclusions of causality.

Conclusions

A multidisciplinary team consisting of a physician and a psychologist is necessary for the recovery of the patients with low back pain. Besides drugs for pain control, social support and individualized rehabilitation program, we believe it is necessary to educate the patient, so that his/her expectations to correlate with the results expected during the rehabilitation.

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