A REVIEW ON SCIATICA NERVE PAIN AND ITS MANAGEMENT

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ABSTRACT

Sciatica refers to pain that radiates along the path of the sciatic nerve, which branch from lower back through hips and buttocks and down each leg. Generally sciatica affects only one side of the body. Patients with sciatica generally complain about associated back pain. Back pain has also been reported to be associated with worse prognosis in patients with sciatica. At present, many medical and surgical interventions are available for the treatment of sciatica, but they are not as much successful for cure of sciatica and procedures associated with it are expensive and time consuming. Surgery is preferred in sciatica patients ineffective of conservative therapy or criteria according to the American association of Surgeons for spinal surgery. Combination of pharmacological and non-pharmacological approaches are good management for sciatica nerve pain.

KEYWORDS: Sciatica nerve pain, surgical interventions, low back pain, conservative therapy.

INTRODUCTION

Sciatica is a common type of pain which is caused by compression or irritation of the sciatic nerve, a large nerve in the body extending from pelvis, through the buttocks, down legs to the feet. Changes in the life style of a human being causes several changes in the general biological system. Professional and social sedentary lifestyle, improper sitting posture in offices, factories, continuous and overexertion jerking movements during travelling and sports – all these factors create undue pressure to the spinal cord and play an important role in producing low back ache and Sciatica. People who are suffering from sciatica may experience wide range of symptoms, the pain sometimes come and go, often remain constant for hours. Most commonly sciatica is caused by a disc problem such as herniated disc that is pressing against a nerve root. Sciatica symptoms are typically felt on the one side of the body.
Depending on the where sciatica nerve roots are compressed, symptoms may be felt in the different areas of leg and into the foot.\[^{1}\]

**Causes of sciatica**

Common cause for sciatic pain is irritation of the root(s) of the lower lumbar and lumbosacral spine.

Additional common causes of sciatica include:

- **Lumbar spinal stenosis** (narrowing of the spinal canal in the lower back)
- **Degenerative disc disease** (breakdown of discs, which act as cushions between the vertebrae)
- **Spondylolisthesis** (a condition in which one vertebra slips forward over another one)
- pregnancy
- Muscle spasm in the back or buttocks

Other things that may make pain worsen include being over weight, no regular physical exercises, wearing high heels, or sleeping on a mattress that is too soft.\[^{2}\]

**Epidemiology**

The lifetime incidence of sciatica is estimated to be between 13% and 40%, corresponding annual incidence of an episode of sciatica ranges between 1% to 5%. clinically significant sciatica is much less common and occurs in only 4% to 6% of people over the course of their lifetime. Depending on the definition of sciatica used by the studies many symptom-free individuals have disc abnormalities when they are evaluated using magnetic resonance imaging (MRI) hence determination prevalence and incidence of disc herniation is very difficult. Takatalo et al. evaluated 558 young adults using MRI for the purpose of determining the prevalence of disc degeneration in this population. They found prevalances of disc bulges and radial tears were 25% and 9.1%, respectively. This study revealed that disc degeneration was common among young people. With increasing age, the incidence and prevalence of lumbar disc degeneration increases and lumbar disc herniations are more cranially localized.

**Risk factors of sciatica**

Risk factors majorly includes age, proffession (jobs which icludes weight lifting) heredity may be largely responsible for the degeneration as well as herniation of intervertebral discs,
Disc degeneration has been shown to be related to an aggrecan gene polymorphism, a vitamin D receptor and matrix metalloproteinase-3 gene alleles. Degenerative arthritis of the lumbar spine, lumbar disc disease and slipped disc and trauma or injury to the lumbar spine.\cite{3}

**Symptoms for sciatic nerve pain**
Common symptoms of sciatica include:

- **Lower back pain**
- **Buttock pain**
- **Leg pain**
- **Numbness**
- **Tingling**
- **Calf muscle weakness**
- **Foot and toe muscle weakness.**\cite{4}

**PATHO-PHYSIOLOGY**
Sciatica nerve pain is generally caused by compression of lumbar nerves L4 or L5 or sacral nerves S1 or S2 or S3 or by compression of sciatic nerve itself. The intervertebral discs consists of an anulous fibrosus, which forms a ring surrounding the nucleus pulposes, the nucleus pulposes may exclude through the tear and press against the spinal nerves in the spinal cord. Inflammation in the spinal cord may spread to adjacent facet joints and cause lower back pain. Intra-vertebral disc abnormalities are generally seen in the asymptomatic patients. Tumour necrosis factor-alpha plays a key role in the inflammatory process and development of sciatica which was first described by Olmark and Larsson. Elevation of other inflammatory mediators such as interleukin-1 alpha has been reported at the site of disc herniation. Pseudosciatic pain can also be caused by compression of peripheral sections of the nerve usually from the soft-tissue tension in the piriformis.

**DIAGNOSIS**
There are several tests for the diagnosis of sciatica pain. During the physical exam, doctor may check muscle strength and reflexes. Patient may be asked for walk on toes or heels, rise from a squatting position and while lying on back, lift legs one at a time straight in the air. Pain that results from sciatica usually become worse during these activities.
IMAGING TESTS
Many people have herniated disks or bone spurs that will show up on X-rays and other imaging tests but have no symptoms. So doctors generally don’t typically order these tests unless the pain is severe.

X-RAY
An X-ray of spine may reveal an overgrowth of bone that may be pressing on a nerve.

MRI
This procedure uses a powerful magnet and radio waves to produce cross-sectional images of back. An MRI produces detailed images of bone and soft tissues such as herniated disks. During the test, patient asked to lie on a table that moves into the MRI machine.

CT SCAN
When a CT is used to image the spine, you may have a contrast dye injected in to the patient spinal canal before the X-rays are taken—a procedure called a CT myelogram. The dye then circulates around spinal cord and spinal nerves, which appear white on the scan.

ELECTROMYOGRAPHY
This test measures the electrical impulses produced by the nerves and the responses of muscles. This test can confirm nerve compression caused by herniated disks or narrowing of spinal canal.[5]

MANAGEMENT
At present, many medical and surgical interventions are available for the treatment of sciatica, but they are not as much successful for cure of sciatica and procedures are expensive and time consuming. The good management strategy for sciatica pain is combination of pharmacological and non-pharmacological treatments. NSAIDS, physical therapy, active modification are commonly prescribed as first line therapy. The other drugs used in the treatment are cortico-steroids, anti-depressants, muscle-relaxants, epidural steroid injections, systemic gluco-corticoid therapy, trigger point injection spinal manipulation, bracing and traction. Several conservative and surgical therapeutic options are available for management of discogenic sciatica. Chemonucleolysis is the last step of conservative management in patients without extruded disk material. For most patients with acute sciatica, symptoms begin to improve in 6 weeks and tend to resolve in 12 weeks with conservative therapy which
is considered as first line of treatment. For patients with low back pain, reassurance and education are key to successful treatment. Patients with sciatica nerve pain generally remains in bed but, complete bed rest results in muscle deconditioning and certain activities can cause increase in low back pain. Some studies shows that NSAIDS are not effective in sciatica. Opiods are generally used in chronic pain but has more side effects and there is a chance of development of tolerance. Injection of intravenous lidocaine(5mg/kg), three times over the course of nine days has been shown to effectively reduce pain in patients with radicular pain. Tumour necrosis factor play an important role in the development of sciatica, infliximab and etanercept are considered for use. Etanercept is a soluble receptor of tumour necrosis factor-alpha and infliximab is a monoclonal antibody of tumour necrosis factor-alpha. Further anti-inflammatory therapies such as anti-IL-1, anti-glutamate anti-TNF-alpha stimulated gene-6(TSG-6) are novel drugs which needs further evaluation to assess their clinical effectiveness. Some studies suggest that addition of vitamin-d to NSAIDS was not more effective than NSAIDS alone. Muscle relaxants can be used alone or in combination with NSAIDS for 7 days. Oral cortico-steroids have no role in conservative management of acute sciatica. In patients with low back pain epidural injection can speed up the recovery process. Spinal manipulation can decrease both local and radiating pain, effective than spinal traction.

Cryotherapy may be beneficial by reducing the inflammation in the acute phase of sciatica. Chymopapian has been used for chemonucleolysis and works through an anti-inflammatory pathway which decreases phospholipase A2 activity around inflamed nerve roots. Agnikarma therapy may be effective and make improvement in symptoms in couple of hours. USFDA approved acupuncture as a treatment of back pain, and the national institute of health has recognized acupuncture as effective in relieving back pain including sciatica. Cognitive-behaviour therapy for control and changing self-defeating behaviours can be helpful in managing sciatic pain, particularly in the short-term. Certain types of massage therapy have been shown to have a number of benefits for back pain, including increased blood circulation, muscle relaxation and release of endorphins.[6]

SURGERY

Surgical discectomy is considered when conservative therapy fails or not effective. The main advantage with surgery is shortening time to recovery up to 50% compared to non-surgical treatment. The American association of Neurological surgeons have suggested the criteria for spinal surgery includes limitation of normal activity or impairment of the life quality due to
back and leg pain, progressive development of neurological deficits, such as leg weakness or numbness, loss of normal bowel and bladder function, difficulty in standing or walking, ineffectiveness of medication and physical therapy reasonably good health. Surgical procedures like Fenestration which is performed unilaterally or bilaterally, depending on the location of the disc herniation and the symptoms. Hemilaminectomy, an option of patients for unilateral symptoms and Laminectomy for patients with bilateral symptoms. Laminoplasty recommended for children due to concern for instability associated with complete laminectomy.\[7\]

CONCLUSION
Sciatica pain usually resolves with in 6-12 weeks by itself, and number of therapies are available which is effective in some patients and are not effective in other patients. Surgery is preferred when the patients meets the criteria according to American Association of Neurological Surgeons for spinal surgery.

REFERENCES
1. Anusha badarla et al, RRJPTS, September, 2016; 4(3).
2. Sciatica(Sciatic nerve pain)-Symptoms, Causes, Diagnosis, Treatment www.webmd.boots.com/pain.../sciatica-sciatic-nerve-symptoms-diagnosis-treatment
3. Vafa Rahimi Movaghar, Mohammed Reza Rasouli, Mahdi-sharif Alhoseini et al.