



ORIGINAL RESEARCH PAPER

Physical Medicine

A SYSTEMIC REVIEW OF LOW BACK PAIN SYNDROME

KEY WORDS:Low Back Pain, Therapy, Etiology, Risk factor

Dr. Lalit Kumar ' Saini' * Senior Medical Officer, Department of Physical Medicine and Rehabilitation (RALC) King George's Medical University, Lucknow. *Corresponding Author

Dr. K. P. Singh Senior Medical Officer, Department of Physical Medicine and Rehabilitation (RALC) King George's Medical University, Lucknow.

Dr. Anurag Patel Junior Resident, DPMR, King George's Medical University, Lucknow

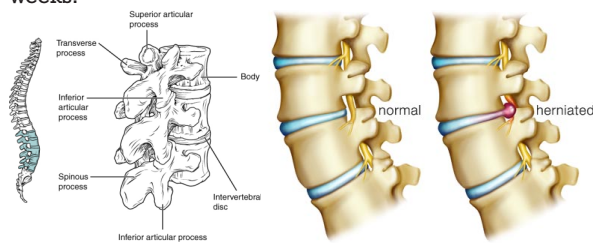
ABSTRACT

Low Back Pain is a leading cause of disability. Low Back Pain in few cases are due to specific cause but most cases are non-specific. Acute back pain is the most common presentation and is usually self-limiting, lasting less than three months regardless of treatment. Chronic back pain is a more difficult problem which often has strong psychological overlay, boredom and work dissatisfaction. Disc protrusions are responsible for pain and surgery is seldom successful at alleviating it. No single treatment is superior to others, patients prefer manipulative therapy but studies have not demonstrated that it has any superiority over others.

1. INTRODUCTION:- Low Back Pain (LBP) is a very common health problem now a days. It affects 60 – 80% of the people throughout their lifetime. A systemic review demonstrated an annual rate of adolescents suffering from their back pain of 10% to 33%. Nowadays 11 – 12% of the population being disabled by low back pain. Low back pain is “pain that occurs posteriorly in the region between the lower rib margin & the proximal thighs”. The most common form of low back pain is the one that is called non – specific low back pain & is defined as “Low Back Pain is not attributed to recognizable, It is known as specific pathology.” Low Back Pain is usually categorized in 3 subtypes;

- Acute =< 6 weeks, immediate onset
- Sub acute = 6 – 12 weeks, slow onset.
- Chronic LBP => 3 months
- Recurrent: recurring after a pain free interval.

Low back pain that has been present for longer than three months, is considered chronic acute back pain between for less than 6 weeks, subacute low back pain between 6 & 12 weeks.

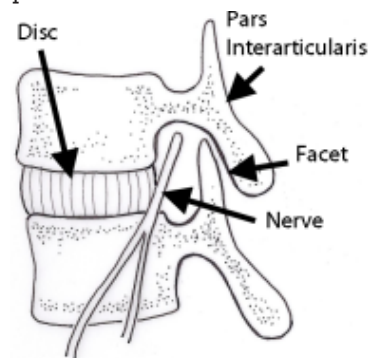


Lower back consists of five vertebrae in the lower part of the spine between ribs & pelvis. these vertebrae are cushioned by small disc which are round and flat, with a tough outer layer (annulus), surrounds a jelly like material called as nucleus (nucleus pulposus). Outer thick ligaments attached to the vertebrae and hold the pulpy disc material in place of the 31 pairs of spinal nerves & roots, including five lumbar (11 – 15) and five sacral (s1 – s5) nerve pairs connect and form plexus in lumbo – sacral region. it is a place of beginning of low back pain in the lower back area.

2. Causes of chronic LBP

- Sprains and strains
- Osteoarthritis and osteoporosis
- Lumbar herniated disc
- Facet joint dysfunction
- Lumbar spinal stenosis
- Spondylolisthesis
- Sacroiliac joint dysfunction
- Kyphotic or scoliotic deformities
- Traumatic injuries

- Compression factors
- Cauda equina syndrome (CES)
- Degenerative disc disease
- Malignancy involving lumbar spine – Myeloma and osteoid osteoma etc.
- Less common causes – infection/tumor/ autoimmune disease
- Motor deficit/ Steroid use/Drug abuse
- Limb length discrepancy
- Functional Low Back Pain
- Piriformis syndrome
- Bursitis – trochanteric/ ischiogluteal
- Fibromyalgia
- Spasticity – C.P/Traumatic Brain Injury/stroke/Spinal cord injury/Multiple sclerosis
- Obesity and mood disorders
- Visceral causes – Endometriosis/ UTI/ Ovulation/ Pregnancy/ Ectopicpregnancy/ Acute Pancreatitis/ Duodenal ulcer/ Cholecystitis/ Nephrolithiasis/ Pyelonephritis/ Prostatitis/Pelvic inflammatory disease/ dissecting aortic aneurysm/visceral cancers etc.
- Job related factors – heavy lifting/ pulling/Twisting/vibrating the spine/Posture etc.



3. Etiology: Unknown, Low Back Pain affects the lower part of the back, Lower back pain tends to begin in the third decade of life and reaches its maximum frequency during the middle age. Individual height, weight and body build do not have any correlation to occurrence. Low back pain is common in 35 percent of sedentary workers and 45 percent of heavy handlers. It is seen that muscle spasm from a simple back pain can limit one's ability to walk or even stand. Whereas a large herniated disc can be completely painless. Most back pain do not signify any serious underlying problems and will sort itself out in few days to a few weeks time.

4. Clinical features/Symptoms: Back pain can have many

symptoms, including a dull aching sensation in the lower back, a stabbing or shooting pain that can radiate down the leg to the foot, an ability to stand up straight without pain, a decreased range of motion and diminished ability to flex the back. The symptoms of back pain, if due to strain or misuse, are usually short lived but can last for days or weeks. Low back is chronic when symptoms have been present for long than three months.

5. Diagnosing Low Back Pain:

Diagnosis is made of a doctor based on history, symptoms, physical examination, may test your ability to stand and walk, spinal range of motion, reflexes, leg strength, ability to detect sensation in your legs and the results of some diagnostic studies. Some patients may be treated conservatively; if conservative treatment is ineffective than physician/surgeon go through on tests which may require, includes:-

- Compluted tomography scan (CT or CAT scan)
- Magnetic Resonance Imaging (MRI)
- X-rays
- Discography
- Myelogram.
- Electro – myography (EMG)
- Nerve conduction studies (MCS)
- Selective nerve root block

6. Management: - Based on the type of the pain you have, depending up to the time duration & flexibility.

a. Conservatively :-

(1) **By NSAIDS** (Non-Steroidal anti- inflammatory drugs such as Ibuprofen, Naproxen Sodium.

(2) **By muscles relaxants** – It can be used after NSAIDS, these muscles relaxants can make you lazy and sleepy if dose is excess or more.

(3) **By Tropical pain Relievers**- These products deliver pain relieving sentence through skin penetration by absorpction through skin surfers or by skin patches.

(4) **By Narcotics**- Drugs containg opioids, such on Oxycodone, Hydrocodone, Tramadol, Morphine, cocaine, methadone, metazocine, Pithidine, Dexopropoxyphene & Ethylmorphine etc may be used under close supervision. It is not work well in chronic pain. It should be use only one week's worth of pills.

(5) **By Antidepressants** – It has a good role in chronic back pain Deloxitine & tricycles antidepressants such as Amitriptyline (Tropptomer) also used in neuropathic pain and some time used in nocturnal enuresis in older children, 6 or over 6 year of age.

(6) **Anti seizure medication**- such as gabapentin or pregabalin for nerve related pain.

(7) **By Injection**- injection reducing inflammation relive pain/It should not utilized for a extended period of a time as they may worsen pain in a long run.

- **Epidural steroid injections:** - Are commonly used as short term choice try treating low back pain.
- **Trigger point Injection** - corticosteroid + local anesthetic.
- **Nerve Root block** – Targets irritated nerves.
- **Radiofrequency ablation (Rhizotomy)** – This procedure is used in several months ago back pain, destroy never fibers that carry pain signals to the brain by inserting a fine needle in an area as an electrode and heated to destroy nerve fibers

7. Traction:- Continues or intermittent force to gradually pule the skeletal Structure in to better alignment.

8. Physiotherapy- programs to strengthen core muscle groups that support the low back, improve flexibility and mobility range of motion, physiotherapist may include-

- Exercise therapy
- Ice/Heat therapy
- Massage therapy
- Transcutaneous Electrical nerve stimulation (TENS).
- Ultrasound Exposure.

9. Corsets – The role of corsets are useful up to some extend, lumbo sacral orthosis, brace (with or without traction loops) back supports by Taylor's brace (frequently nor used nowadays) Lumbo Sacral Frame, Abdominal binders etc, in the treatment of low back pain patents. Corsets are more helpful and used while going up on stairs, rough roads and jerky traveling. It provides the mechanical and psychological support to the Low Back Pain patients.



L.S. Corset

10. By Acupuncture- It is moderately effective for chronic Low back pain, inserting thin needles in to precise points or and directions stimulate them (by passing low voltage electric current or twisting), may cause the body to release naturally occurring pain relieving chemical substances such are endorphins, serotonin and acetylcholine.

11. By Yoga:- It is a self-awareness programme to increase flexibility and strength. It helpful in Low Back Pain to maintain healthy muscles which are supporting spine, yoga poses called Aasanas, are important for stretching and strengthening of the back muscles. Some Aasanas are important as Adhomukh svanasan (Down word facing dog), marjaryasana (Cat/cow pose), Salabhasana (Lotus pose), Trikonanasan (Triangle pose), to get relief from back ache or back pain with rediculpathies.

12. By platelet rich plasma (PRP) - Is taken from your own Blood that has concentrated amount of blood building blocks known as platelets. PRP is directly injected to the damage disc, your own healing system to accelerate improvement of injured tendons, ligaments, muscles and joints.

13. By stem cells:- It is a emerging treatment like PRP, injects stem cells, harvested from your hip in to the intervertebral disc or discs causing pain and at saero-iliac joint but it is needed more trail/ Research in ageing patients under supervision.

(b) **Surgical Treatment-** generally surgery is not necessary for most of the cases who have low back pain. Common spinal surgeries include:-

(1) **By spinal fusion:-** Two or more vertebrae are permanently fused together to limit the excess spinal motion. Spinal fusion may be done to correct spinal deformities or to increase the spine's stability in spinal osteoarthritis or herniated disc.

(II) **By laminectomy and Laminotomy** – Surgeon removes the back portion of the vertebrae and create a more space for spinal cord or spinal nerves, known as laminectomy. In the similar, surgeon will removal a small piece of bone or lamina

of the vertebrae (from the back) is known as Laminotomy.

(III) Discectomy and microdiscectomy: - surgeon operates to remove a portion of the damaged disc, it is known as discectomy, when surgeon uses a minimally invasive technique by a small incision that is called microdiscectomy. Discectomies are performed in routine practices. It has low rate of complication and good effectiveness.

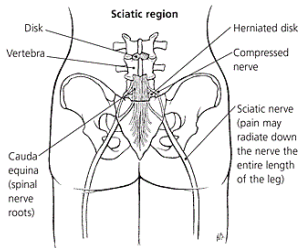
(IV) Foramiotomy- Small piece of bone over the nerve are removed through a small slit or hole to release the pressure on nerve.

(V) Nucleoplasty- It is a type of laser surgery, under x-ray guidance; a needle is inserted into the disc, needle tip heated to 40-70 degree Celsius, creating a field that vaporizes the tissue in the disc, reducing its size and relieving pressure on the nerves.

7. Prognosis: - In acute Low Back pain and disability improve with in first six weeks time, complete recovery reported by 40 to 90% in next six weeks times. Some psychological problems such as depression, unhappiness occur in more than half of patients. In chronic Low Back pain continue to have poor outcomes and moderate pain and disability. Prognosis may be influenced by expectations of the patient's effort and will.

8. Risk Factors: -

- Age- as you get older, starting around as 30-40 years.
- Lack of exercise- weak, unused muscles leads to low back pain.
- Excess Weight- puts extra stress on your back.
- Diseases- some type of arthritis and cancer.
- Improper lifting – legs can lead to back pain.
- Psychological conditions- depression, anxiety, stress etc.
- Smoking- increase rate of back pain.
- Smoking prompt coughing herniate disc.
- Smoking decrease blood flow increase risk of osteoporosis.
- Back pack over lead in children.



- **9. Prevention-** By lowering the risk factors-
- Exercise- Regularly to keep muscles strong Flexible and good posture.
- Diet- Good nutrient diet /calcium /phosphorus/ Vit-D/Protein/vitamins
- Smoking- reduces blood flow of spine/increase the risk of osteoporosis and impede healing.
- Body weight-Target to strengthen lower back and abdomen muscles.
- Posture-On standing/sitting/ lifting /contact stress.

10. Conclusion- Low Back Pain is extremely common the most appropriate diagnostic approach is to look for specific biomechanical causes and identify potential anatomic pain generators when possible. Most symptoms resolve relatively promptly with little intervention, but recurrence is common. Back pain syndrome is not a disease but it a group of symptoms that usually is acute and self limited.

REFERENCES

1. Chou R, et al. Nonpharmacologic therapies for low back pain: A systematic review for an American College of Physicians clinical practice guideline.

Annals of Internal Medicine. 2017; doi:10.7326/M16-2459.

2. Kellerman RD, et al. Spine pain. In: Conn's Current Therapy 2020. Elsevier; 2020. <https://www.clinicalkey.com>.

3. Low back pain. American Association of Neurological Surgeons. <https://www.aans.org/en/Patients/Neurosurgical-Conditions-and-Treatments/Low-Back-Pain>.

4. Walls RM, et al., eds. Back pain. In: Rosen's Emergency Medicine: Concepts and Clinical Practice. 9th ed. Elsevier; 2018. <https://www.clinicalkey.com>

5. Foster NE, et al. Prevention and treatment of low back pain: Evidence, challenges and promising directions. The Lancet. 2018; doi:10.1016/S0140-6736(18)30489-6.

6. Knight CL, et al. Treatment of acute low back pain. <https://www.uptodate.com/contents/search>

7. Chou R. Subacute and chronic low back pain: Nonpharmacologic and pharmacologic treatment. <https://www.uptodate.com/contents/search>.

8. Manusov EG (September 2012). "Evaluation and diagnosis of low back pain". Primary Care. 39 (3): 471–9. doi:10.1016/j.pop.2012.06.003. PMID 22958556.

9. National Institute of Neurological Disorders and Stroke. Pain: Hope Through Research. <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Hope-Through-Research/Pain-Hope-Through-Research>. June 9, 2017.

10. Balagué F1, Mannion AF, Pellisé F, Cedraschi C. Non-specific low back pain. Lancet. 2012 Feb 4;379(9814):482-91.

11. Burton AK. European guidelines for prevention in low back pain. COST B13 Working Group. 2004:1-53. (Level 1A)

12. Kinkade S. Evaluation and treatment of acute low back pain. Am J Fam Phys. 2007; 1182-1188.

13. Aure OF, Nilsen JH, Vasseljen O. Manual Therapy and Exercise Therapy in Patients With Chronic Low Back Pain: A Randomized, Controlled Trial With 1-Year Follow-Up. Spine. 2003;28(6):525-532.

14. Ferreira ML, Ferreira PH, Latimer J, Herbert RD, Hodges PW, Jennings MD, Maher CG, Refshauge KM. Comparison of General Exercise, Motor Control Exercise and Spinal Manipulative Therapy for Chronic Low Back Pain: A Randomized Trial. 2007;131:31-37.

15. Chou R, Qaseem A, Snow V, Casey D, Cross TJ, Shekelle P, Owens DK. Diagnosis and Treatment of Low Back Pain: A Joint Clinical Practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147:478-491.

16. Chou R. Pharmacological Management of Low Back Pain. Drugs [online]. 2010;70 (4):387-402. Available from MEDLINE with FULL TEXT. Accessed April 30, 2011.

17. Albert HB, Sorensen JS, Christensen BS, Manniche C. Antibiotic Treatment in Patients with Chronic Low back Pain and Vertebral Bone Edema (Modic Type 1 Changes): A Double-blind Randomized Clinical Controlled Trial of Efficacy. Euro Spine Journal 2013;22:607-707

18. British Association of Spinal Surgeons. Antibiotic Treatment for Chronic Low Back Pain. <http://www.spinesurgeons.ac.uk/patients/antibiotics-back-pain> (accessed 11 October 2015)

19. National Institute for Health and Care Excellence. Low back pain and sciatica in over 16s: assessment and management. NICE guideline [Ng59]. London: NICE, 2016.

20. Stockendahl MJ, Kjaer P, Hartvigsen J, et al. National Clinical Guidelines for non-surgical treatment of patients with recent onset low back pain or lumbar radiculopathy. Eur Spine J 2018;27:60-75.

21. National Library of Medicine. MedlinePlus. (Updated April 30, 2020.) "Back Pain." <https://medlineplus.gov/backpain.html>

22. Johns Hopkins Medicine. (n.d.) "Lower Back Pain: What Could It Be?" <https://www.hopkinsmedicine.org/health/conditions-and-diseases/back-pain/lower-back-pain-what-could-it-be>

23. National Institute of Neurological Disorders and Stroke. (April 27, 2020). "Low Back Pain Fact Sheet." <https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Low-Back-Pain-Fact-Sheet>

24. Cedars-Sinai. (n.d.) "Degenerative Disc Disease." <https://www.cedars-sinai.org/health-library/diseases-and-conditions/d/degenerative-disease.html>

25. American Association of Neurological Surgeons. (n.d.) "Low Back Strain and Sprain." <https://www.aans.org/Patients/Neurosurgical-Conditions-and-Treatments/Low-Back-Strain-and-Sprain>

26. Mayo Clinic. (August 1, 2020.) "Sciatica." <https://www.mayoclinic.org/diseases-conditions/sciatica/symptoms-causes/syc-20377435>

27. American Academy of Orthopaedic Surgeons. (n.d.) "Adult Spondylolisthesis in the Low Back." <https://orthoinfo.aaos.org/en/diseases-conditions/adult-spondylolisthesis-in-the-low-back/>

28. Mayo Clinic. (n.d.) "Spinal stenosis." <https://www.mayoclinic.org/diseases-conditions/spinal-stenosis/symptoms-causes/syc-20352961>

29. Arthritis Foundation. (n.d.) "When Back Pain May Mean Arthritis." <https://www.arthritis.org/health-wellness/about-arthritis/where-it-hurts/when-back-pain-may-mean-arthritis>

30. Arthritis Foundation. (n.d.) "Osteoporosis." <https://www.arthritis.org/diseases/osteoporosis>

31. American Association of Neurological Surgeons (n.d.) "Spinal Tumors." <https://www.aans.org/Patients/Neurosurgical-Conditions-and-Treatments/Spinal-Tumors>

32. Cochrane Database of Systematic Reviews. (2010.) "Advice to rest in bed versus advice to stay active for acute low-back pain and sciatica." <https://pubmed.ncbi.nlm.nih.gov/20556780/>

33. National Center for Complementary and Integrative Health. (2016.) "Acupuncture: In Depth." <https://www.nccih.nih.gov/health/acupuncture-in-depth>

34. Journal of the American Medical Association. (2018.) "Effect of Opioid vs Nonopioid Medications on Pain-Related Function in Patients With Chronic Back Pain or Hip or Knee Osteoarthritis Pain The SPACE Randomized Clinical Trial." <https://jamanetwork.com/journals/jama/fullarticle/2673971>

35. Spine Journal. (2015.) "Can patient characteristics predict benefit from epidural corticosteroid injections for lumbar spinal stenosis symptoms?" <https://pubmed.ncbi.nlm.nih.gov/26096484/>