

Research Article

An overview of evaluation of low back pain

Farid Mohammed^{1*}, Arshiya Khan², Vikas Verma¹, Abhishek Pandey¹

¹Department of Orthopedics, Era's Lucknow Medical College, Lucknow, India

²Department of Obstetrics and gynaecology, Integral Institute of Medical Sciences, Lucknow, India

Received: 10 May 2016

Revised: 11 May 2016

Accepted: 03 June 2016

*Correspondence:

Dr. Farid Mohammed,

E-mail: drfaridmohd@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Low back pain has plagued humans for thousands of years and it is extremely common with lifetime prevalence of 60-90% and annual incidence of 5% so we studied the problem of acute lumbosciatic syndrome which is defined as pain located near the loins in the lower back region and along the sciatic nerve, its remedies with objective to find out the possible causes of acute lumbosciatic syndrome. Aim of the study was to study characteristics of low back pain patients and outline the best possible treatment for them.

Methods: The study comprises of 110 patient of adolescent to elderly age presenting with acute low back pain with radiation of pain to buttock and thigh. The prospective randomized study was completed in two years at the department of orthopedics at a tertiary care center.

Results: Acute low backache was found to be more common in upper middle class and Lower class. Medium and heavy manual workers were found to be more predisposed to acute low backache and among specific occupation porters carrying heavy weights were most commonly involved. Prolapsed intervertebral disc was found be commonest cause of acute lumbosciatic syndrome. By conservative treatment in a year there was 76% of patients showed improvement in back pain, 73% showed improvement in paresthesias, 79% showed improvement in numbness and 69% showed improvement in neurological claudication. Education in proper posture and body mechanics is helpful in returning the patient to the usual level of activity after the acute exacerbation has been relieved.

Conclusions: Every patient of low back pain should be thoroughly examined on all parameters before reaching to final diagnosis and treatment of low back pain by conservative treatment should be aimed on the prevention rather than treatment by multiple drugs.

Keywords: Low back pain, Lumbosciatic syndrome, Disc herniation

INTRODUCTION

Low back pain is an extremely common problem with a lifetime prevalence of 60-90% and an annual incidence of 5%.¹⁻²

Low back pain has also been a cause of disability and occupational absence. Though the vast majority (almost one third) of individuals will experience low back pain in their lifetime, the condition is fortunately self-limiting in

most cases.³⁻⁴ For those in whom it is not self-limiting and who continue to suffer low back pain, a plethora of potential treatment exists. Numerous mechanical and life style related risk factors can lead to low back pain. Prolapsed intervertebral disc is the commonest cause of lumbo-sciatic syndrome⁵. A working knowledge of relevant anatomy, biomechanics and epidemiology is essential for an organized functional approach in making a diagnosis. A detailed history and musculoskeletal physical examination coupled with the appropriate

selection, interpretation and use of imaging studies are essential.

So an endeavour has been made to study the problem of acute lumbo-sciatic syndrome, their possible mechanical and physiological causes, appropriate imaging techniques and their modalities of different treatment.

METHODS

110 cases of acute low back pain were studied and selected them randomly. The criterion of selection was patient of adolescent to elderly age presenting with acute low back ache of 0-6 months duration, traumatic or non-traumatic, with or without neurological deficit. A detailed clinical history of all patients was taken with help of Oswestry disability index, clinically examined and investigated to reach a clinical tentative diagnosis before specific treatment was instituted.⁶ All the information was recorded in a case sheet.

During history patient's age, sex, socioeconomic status and occupation of the patient were recorded. It was ascertained whether the patient's occupation involved lifting of heavy weights, excessive standing, bending for longer periods, squatting and cross leg sitting.⁷ On basis of manual work patients were classified as household worker, hard, moderate and minimal manual worker.

A detailed history of pain comprising of site of pain, duration, character, aggravating/ relieving factors, radiation and associated factors like paresthesias, numbness, weakness of lower limbs and involvement of bladder and bowel was taken. Also personal features like obesity and any chronic illness was noted down. In females a detailed obstetrical and gynecological history was also assessed.

The objective of physical examination of the lumbosacral spine was to demonstrate those static and dynamic abnormalities that help in sorting out the disease entities that may be responsible for lumbo-sciatic syndrome. All patients were examined in standing, sitting and lying down (supine and prone) position. In standing position spine was viewed for curvatures and postural deformities. Laterally-hyperlordosis or a flattened lumbosacral curve was identified and kyphosis was noted.

Anteriorly-shoulder and iliac wings should be at equal heights. The patient was asked to squat in, this maneuver tests the general strength and integrity of the function of joints from the hip to the toes. The muscle power of lower extremity was tested by toe raises, standing on both feet, this test measures sacral root function primarily. The fifth root function is assessed by Tredelenberg test. Spinal motion is important in term of symmetry and rhythm which was tested by asking the patient to flex, extend and laterally bend the lumbosacral spine. Patient with localized mechanical disorder maintain the lordosis while bending from the hips when asked to flex forwards.

Inter-space between spinous process and abnormal motion segment was noted. After flexion it was observed how the patient regains the erect posture. Patient with back lesion return to the erect posture utilizing a fixed lordosis and rotating the pelvis with the help of knee and hip flexion.

Pain that increases with forward flexion suggests an abnormality in the anterior element of the spine including discogenic diseases. Pain that increase by extension suggests disease in the posterior elements of spinal column including the apophyseal joint and that produced in a paraspinal location on the site opposite to the lateral bending motion may be of muscular, ligamentous, or fascial origin.

In supine position a detailed neurological examination of the lower limb was done in a systemic manner, any evidence of motor weakness, muscle wasting or loss of tone was recorded. Sensory impairment in the lower limb especially to pin prick was tested. Straight leg raising test to detect the irritation of the sciatic nerve at L4-5 and S1 was done which stretches the sciatic nerve, its nerve root and dural attachment.⁸ When the dura is inflamed and stretched the patient will experience pain along its anatomic course to lower leg, ankle and foot.

Dural movements start at 30 degree of elevation. Pain is maximum between 30 to 70 degree of elevation. Dorsiflexion of the foot will exacerbate the pain. Bilateral straight leg raising test was also assessed for the sciatic nerve irritation. This test was done by lifting both the legs by both ankle with the knee extended. This motion causes the pelvis to tilt upwards, diminishing the stretch on neural elements useful to identify patients with psychological pain who frequently complaint of pain at lower elevation than noted during the unilateral straight leg raising test.

Lasegue's test, figure of four test, femoral stretch test, Waddell test for functional low backache, femoral stretch test (which is usually strongly positive in patients with protrusions at L2-L3 and L3-L4, slightly positive or negative in L4-L5 disc protrusions and negative in cases with a lumbosacral protrusion) and Schober test for lumbosacral flexion movements were also done in all patients.¹⁵

Function of three most commonly affected nerve root was tested (i) S1 by diminished or absent ankle jerk, atrophy of calf, posterior calf and decreased sensation on lateral side of foot (ii) L5 by EHL motor function showing weakness in the extension of the large toe, sensory deficit associated with L5 was noted over the anterior tibial and dorsomedial aspect of foot down to the great toes (iii) L4 by quadriceps muscle weakness demonstrated in the knee extension and sensory loss over the anteromedial aspect of leg. An enquiry was made about the history of trauma to back, history suggestive of poor nutrition, history of any previous surgery, strenuous activity involving stress

to the back was noted. All the patients were radiographed in anteroposterior and lateral view. Flexion and extension views were done where needed.¹⁰ A check was kept not to over utilize the X-ray.¹¹ Those cases were subjected to CT / MRI scan¹² where neurological deficit was present and X- ray was not conclusive. In CT scan any destruction of vertebra, prolapse disc and compromise of dural sac, reduction of epidural space, compression of nerve root and abnormality of facet joint and spinal canal stenosis was looked. MRI was done for better visualization of soft tissue and nerve tissue, impingement of nerve root, bulging / herniated disc,

enlargement of ligamentum flavum, facet arthropathies and was also used to plan interventional therapy. Various modalities of treatment like physical and manual therapy, psychological therapy, patient education, medical and surgical treatment was started on the basis of final diagnosis.

RESULTS

The study constituted analysis of problem of acute low back pain in patients attending the orthopedics outdoor, emergency and indoor wards of a tertiary care center.

Table 1: Distribution of enrolled patients by age, sex, occupation and duration of low back pain.

		No of case		Percentage	
		Male	Female	Male	Female
Age group (in years)	• 0-20	2	0	1.8	0.0
	• 20-40	21	20	19.0	18.1
	• 40-60	37	10	33.6	9.09
	• 60-80	07	12	6.36	10.9
	• >80	00	01	0	09
Occupation	Household work	12		10.90	
	Minimum manual work	10		9	
	Medium manual work	30		27.27	
	Heavy manual work				
	• Farmers	12	58	20	52.73
	• Porters	19		32.73	
	• Labourers	9		16.36	
• Office goers	11	18.18			
• others	7	12.73			
Time (in months)	• 0-1	58		53	
	• 1-3	42		38	
	• 3-6	10		9	

Table 2: Distribution of symptoms and neurological impairment (motor and sensory).

		No	Percentage
Symptoms	Back pain without leg pain	14	12.73
	Back pain with leg pain	96	87.27
	Paresthesia	60	54.55
	Numbness	58	52.73
	Neurological claudication	26	23.64
	Bladder/Bowel involvement	2	1.82
Motor Level	Knee flexor (L2-L3)	5	5
	Knee extensor (L3-L4)	5	5
	Ankle dorsiflexor (L4-L5)	30	27
	Ankle plantarflexor (S1-S2)	8	7
	EHL (L5)	62	56
Sensory Level	Posterolateral thigh, anterior knee and medial aspect of Leg (L4)	12	10.91
	Anterior leg, Dorsum of toe, Great toe (L5)	50	45.45
	Lateral malleolus & foot, heel and web of fourth & fifth toe (S1)	32	29.09
	Posterior aspect of thigh (S2)	8	7.27

There were total 17570 cases of bone and joint diseases during the period of study out of which 2110 (12%) cases were having problems of low back pain and 316 of these 2110 (15%) cases of the low back pain presented with acute symptoms. Out of these cases, 100 cases were acute fresh cases of acute low back pain and 216 cases were chronic cases of low back pain with acute exacerbation. Out of total cases of acute low back pain, 200 (63%) were male patients and 116 (37%) were female cases. Hence males were seemed to be more predisposed with male to female ratio of 1.72:1.¹³

Table 3: Result of straight leg raising and Laseague’s test.

SLR	Unilateral affected	Unilateral crossed	Bilateral
Positive	54	12	10
Negative	34		
Laseague’s test	Positive	70	
	Negative	40	

Table 4: Various modalities of treatment given to number of patient in study group.

Treatment modalities	Number of patient	Percentage
General		
Absolute bed rest for 2 weeks.	To all patient	100
Postural maintenance with pillow support below both knees.		
Back Care		
Passive modalities		
Heat or ice application	110	100
Diathermy	32	29
Light massage	90	81.82
Electrical stimulation (TENS)	22	20
Lumbar traction	12	10.91
Pharmacologic modalities		
Non-steroidal anti-inflammatory drugs.	96	87.27
Muscular relaxant.	32	29
Neurotropics.	70	63.64
Drugs for any specific condition	12	10.91
Exercises (After relief of pain)		
Active exercises	100	91
Assisted exercises	8	7.27
Passive exercises	60	55
Flexion & extension exercises	76	69.09
Stabilization exercises	76	69.09
Range of motion exercises	100	91
Muscle strengthening	76	69.09
Specific exercises	18	16
Epidural medication	24	22
Orthotic support	30	27.27
Re-assessment of patient		
Resumption of duty	Done specifically on all patient	
Progression of mechanical program		
Modification of working diagnosis		
Preventive education		
Clinical assessment		
Re-assessment of patient at continuous interval of time	Of all patients	

110 cases of acute low back pain were studied regularly and selected them randomly. The criterion of selection was patient of any age presenting with acute low back ache of 0–6 months duration, traumatic or non- traumatic, with or without neurological deficit. In our study the age of patients ranged from 20 to 81 years. Maximum numbers of patient were in the age group of 40-60 years (51.7%) with males having greater predisposition for

acute low back pain than females.⁸ Of the total number of patients included in our study 63.64% patients were male and 36.36% were female.

DISCUSSION

Out of the 110 patients studied and it was observed that maximum patients belonged to the upper lower class

(47.27%) followed by lower class (32.73%), a finding that has been previously reported as well.¹³ Present study showed that heavy manual worker (52.73%) were the most predisposed to acute low back ache followed by medium manual worker (27.27%).

Among the specific occupation the porters (32.73%), lifting and walking with heavy weights were the most predisposed to acute lumbosacral syndrome followed by farmers (20%), office goers (18.18%) (specially persons spending long hours over computers) and labourers (16.36%). Out of the total patients included in the study 58 patients (53%) presented with duration of 0-1 month of backache and 42 patients (38%) had a backache for 1-3 months and 10 patients (9%) for 3-6 months.

Out of the 110 patients 52.73% patients presented with radiation of leg pain for less than 1 month, 38.18 % patients had radiating pain for one to three months and 9.09 % had radiating pain for three to six months. All of the patients included in the study had radiating pain of variable duration, 54.55% patients had paresthesia, 52.73% patients had numbness of lower limbs, 23.64% of patients had neurological claudication and 1.82% patient had bladder and bowel involvement.

Straight leg raising test was positive in 76 patients (69%) out of which 54 patients (71.05%) presented with unilateral positive passive SLR test, 12 (15.79%) as unilateral crossed and 10 patients (13.16%) presented with bilateral positive passive SLR test.¹⁴ Laseague's Test was also positive in 70 patients (64%). Out of the total patients studied 32 patients (29.09%) had a sensory impairment over L5-S1 dermatome while 12 patients (10.91%) had L4-L5 level of sensory impairment. 7.27 % of patients showed sensory impairment of S2 dermatome. Out of 110 patients (56%) had involvement of extensor hallucis muscle.

The other groups involved were ankle dorsiflexion, ankle plantar flexors, knee extensors, knee flexors in decreasing order of frequency. There were 40% patients who presented with absent ankle reflex and 5.45% patients with absent knee reflex. The patellar tendon reflex was absent in cases of L4 root compression while Achilles reflex was absent in S1 root compression. The pattern of herniation of intervertebral disc showed that maximum number of patients had significant disc herniation at the level of L5-S1 intervertebral disc. Ten patients had herniation at more than one intervertebral level.

After Epidural Medication 58.33 % of patients had relief of pain, 55.55% had improved SLR, 33.33% of patients showed neurological improvement.¹⁷ After 1 month of epidural medication 83.33% patients showed decreased analgesic consumption but after 1 year only 60% of patients returned back to increased analgesic dose.

All the patients were examined on follow up at 6 weeks, 3 months, 6 months and 1 year. After a follow up period

of 1 year all the patients were able to walk, 4% of patients had pain doing routine activities, 10% of patients complained of pain even on slight exertional activity and 16% had pain only after >2hours of exertional activity. 70% of patients were able to do normal routine and exertional activities.¹⁸

CONCLUSION

Every patient of low back pain should be thoroughly examined on all parameters before reaching to final diagnosis and treatment of low back pain by conservative treatment should be aimed on the prevention rather than treatment by multiple drugs. In order to increase physical activities over time patients should be given a physiotherapy program to avoid decrease in muscle strength and tone and decrease in range of joint motion. Education in proper posture and body mechanics is helpful in returning the patient to the usual level of activity after the acute exacerbation has been relieved which can be given individually or in groups.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Mehra A, Baker D, Disney S, Pynsent PB. Oswestry Disability Index scoring made easy. *Ann R Coll Surg Engl.* 2008;90(6):497-9.
2. Bindra S, Sinha AKG, Benjamin AI. Epidemiology of low back pain in Indian population: A review. *International Journal of Basic and Applied Medical Sciences.* 2015;5(1):166-79
3. Deyo RA, Rainville J, Kent DL. What can the history and physical examination tell us about Low back pain. *JAMA.* 1992;268(6):760-5.
4. Hoy D, Brooks P, Blyth F, Buchbinder R. The Epidemiology of low back pain. 2010;24(6):769-81.
5. Nachemson A. The lumbar spine: an orthopaedic challenge. *Spine.* 1976;1:59-71 .
6. Fairbank JCT, Couper J, Davies JB, O'Brian JP. The Oswestry low back pain disability questionnaire. *Physiotherapy.* 1980;66:271-3.
7. Middleton GS, Teacher JH. Injury of the spinal cord due to rupture of an intervertebral disc during muscular effort. *Glasgow Med J.* 1911;6:1-6.
8. Fami WH. Observation on straight leg raising test with special reference to nerve root adhesions. *Can J Surg.* 1966;9:44-8.
9. Estridge MN, Rouhe SA, Johnson NG. The femoral stretching test : a valuable sign in diagnosing upper lumbar disc herniation. *J Neurosurgery.* 1982;57:813.
10. Scavone JF, Latshaw RF, Weidner WA. Anteroposterior and lateral radiographs: an adequate lumbar spine examination. *AJR.* 1981;136:715-7.

11. Deyo RA, Diehl AK, Rosenthal M. Reducing roentgenography use. *Arch Intern Med.* 1987;147(1):141-5.
12. Ergun T, Lakadamyali H. CT and MRI in the evaluation of extraspinal sciatica. *The British Journal of Radiology.* 2010;83(993):791-803.
13. Ahmad SJ, Rather AH. Clinical pattern of chronic low backache. A prospective study of 210 cases at a multidisciplinary hospital. *JK-Practitioner.* 2014;19(1-2):21-7.
14. Fami WH. Observation on straight leg raising test with special reference to nerve root adhesions. *Can J Surg.* 1966;9:44-8.
15. Estridge MN, Rouhe SA, Johnson NG. The femoral stretching test : a valuable sign in diagnosing upper lumbar disc herniation. *J Neurosurgery.* 1982;57:813.
16. Lurie JD, Faucett SC, Hanscom B, Toteson TD, Ball PA, Abdu WA, Frymoyer JW, Weinstein JN. Lumbar discectomy outcomes vary by herniation level in the spine patient outcomes research trial. *J Bone Joint Surg Am.* 2008;90:1811-9.
17. White AH, Derby R, Wynne G. Epidural injection for the diagnosis and treatment of low back pain. *Spine.* 1980;5:78.
18. Sologard T, Kleppe H. Long term results of lumbar intervertebral disc prolapse. *Spine.* 1983;8:793.

Cite this article as: Mohammed F, Khan A, Verma V, Pandey A. An overview of evaluation of low back pain. *Int J Res Med Sci* 2016;4:2777-82.