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## Evaluation of burden of low back ache and effectiveness of available treatment options: A prospective clinical study

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### Abstract

**Objective:** To assess the possible causes, association with occupation and effectiveness of available treatment options for acute Low Back Ache.

**Design:** Prospective clinical study with one year follow up.

**Methods:** The study comprises of 220 patients of adolescent to elderly age presenting with acute low back ache with or without radiculopathy, participating in the study according to inclusion and exclusion criteria after getting written and informed consent, treated by conservative or operative method as per standard protocol, and evaluation of functional outcome and results were done.

**Results:** Out of the 220 patients studied we observed that maximum patients belonged to the upper lower class (38.17%) followed by lower class (16.81%), a finding that has been previously reported as well. Our study showed that heavy manual worker (28.17%) were the most predisposed to acute low back ache followed by medium manual worker (26.81%). Among the specific occupation the porters (16.81%), lifting and walking with heavy weights were the most predisposed to acute low back ache followed by farmers (11.36%), office goers (12.27%) (Especially persons spending long hours over computers) and labourers (08.63%). Straight leg raising test was positive in 67.72% out of which 50.45% presented with unilateral positive passive SLR test, 10% as unilateral crossed and 7.27% presented with bilateral positive passive SLR test. Laseague's Test was also positive in 62.27%, 11.81% had a sensory impairment of L4 dermatome, 46.36% of L5 dermatome, 27.72% of S1 and 6.81% of S2 dermatome. 54.09% had involvement of extensor hallucis muscle. After a follow up period of 1 year all the patients were able to walk, 4.43% of patients had pain doing routine activities, 11.24% of patients complained of pain even on slight exertional activity and 16.89% had pain only after >2hrs of exertional activity. 71.52% of patients were able to do normal routine and exertional activities.

**Conclusion:** The main aim of low back pain treatment by conservative means should be the prevention instead of treatment by many drugs. A comprehensive examination of all patients of low back pain should be carried out before establishing the concrete diagnosis. Also, a proper regime of physiotherapy should be encouraged to facilitate muscle strength and tone and to increase the joint motion range. Once the acute stage has passed and the patient has been relieved of pain, proper training regarding the posture and body mechanics is very useful to enable the achievement of normal physical activity.

**Keywords:** LBA, Lumbosciatic Syndrome, Disc Prolapse

**Conflict of Interest:** None

### 1. Introduction

One of the most common problem encountered in day to day orthopaedic OPD is low back ache with lifetime prevalence of around 60-90% and an annual incidence of 5% [1]. Inter vertebral disc prolapse is the commonest cause of Lumbo-sciatic syndrome [2]. LBA is also one of the most common orthopaedic causes of disability and occupational absence, thus affecting ADL. LBA is mostly a self-limiting condition [3]. Several life style and mechanical risk factors are associated with LBA. Clinical history along with detailed general physical and local examination coupled with proper investigations is essential for making proper diagnosis of LBA and treatment. For a successful treatment a proper clinico-radiological examination with knowledge of relevant anatomy, biomechanics and epidemiology is essential. This is an effort to find a solution to the menace of acute lumbar sciatic syndrome, to find its causes, its possible causes, suitable diagnostic techniques and treatment options.

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## 2. Materials and Methods

After approval from institutional ethical committee (IEC), this prospective clinical study was done by authors in Eras Lucknow Medical College & Hospital, Lucknow, India to know the burden of acute Low Back Ache (LBA) in patients attending the hospital (orthopedic outdoor, emergency and indoor wards). Treatment started once proper diagnosis of LBA was made by detailed history, clinical examinations and proper investigation. Oswestry disability index was used in all cases [4]. In the history taking demographic data like age, sex, socioeconomic status and occupation of the patient were taken. History of excessive weight lifting, prolonged standing, forward bending, squatting and sitting cross legged associated with occupation and personal history like obesity, chronic illness, trauma, previous surgery & in females obstetrical and gynecological history was also taken into account. On the basis of occupation patients were classified as household worker, hard, moderate and minimal manual worker. A detailed history regarding site of pain, duration, character, aggravating/relieving factors, radiation and associated factors like paresthesia, numbness, weakness of lower limbs and involvement of bladder and bowel was taken. Physical examination was done to demonstrate static and dynamic factors responsible for lumbo-sciatic syndrome. In standing, sitting and lying down (supine and prone) positions detailed examination was done. Spinal curvature & deformities like hyperlordosis, flattened lumbosacral curve, kyphosis, level of shoulder and iliac wings, ability to squat, function and strength of joints, detailed neurological examination, spinal movement, trendelenburg test were examined in detail. Pain with forward flexion suggests pathology in the anterior element of the spine including discogenic diseases and in extension suggests pathology in the posterior elements of the spinal column including the apophyseal joint and pain in paraspinous location on the site opposite to the lateral bending motion may be of muscular, ligamentous, or fascial origin. SLRT (Straight leg raising test) [5] was done to detect the irritation of the sciatic nerve at L4-5 & S1, which stretches the sciatic nerve, its nerve root and dural attachment. In inflammation of dura pain is along its anatomic course to lower leg, ankle and foot. Pain is maximum between 30 to 70 degree of elevation, pain is increased by dorsi flexion of the foot. Laseague’s test, figure of four test, femoral stretch test, Waddell test for functional low backache, femoral stretch test [6] (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. L4 nerve root was tested by quadriceps muscle weakness demonstrated in the knee extension and sensory

loss over the anteromedial aspect of leg, L5 nerve root was tested by testing 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 the foot down to the great toes, S1 nerve root was tested by decrease or absent ankle jerk, atrophy of calf, posterior calf and decreased sensation on lateral side of foot.

Radiological assessment was done in the form of X-Ray by anteroposterior and lateral view. Flexion and extension views were done as and when needed [7]. CT/MRI scan was done in patients with neurological deficit [8]. CT scan is superior than X Rays to demonstrate any destruction of vertebra, prolapsed 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 is the investigation of choice for better visualization of soft tissue and nerve tissue, impingement of nerve root, bulging / herniated disc, enlargement of ligamentum flavum, facet arthropathies and was done for same and also 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.

### 2.1 Statistical Analysis

The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 15.0 statistical Analysis Software. The values were represented in Number (%) and Mean ±SD.

### 3. Results

In this study we randomly enrolled 220 cases of acute low back pain according to inclusion and exclusion criteria. Patient of any age presenting with acute low back ache of 0–6 months duration, traumatic or non-traumatic, with or without neurological deficit was included in study while cases of more than 6 months duration were excluded from study.

During the period of this study total 34575 orthopaedics cases were registered in our institute out of which 5298 (15.32%) cases were suffering from Low Back Ache. Around 18.42% of these 5298 LBA patients i.e. 976 patients were having acute symptoms. Among these cases, 341 cases were acute cases of LBA and 635 cases were chronic cases of LBA with acute exacerbation.

In our study the age of patients ranged from 20 to 87 years. In our study age group of 40 – 60 years comprises of maximum number of patients 45.45%. Out of total cases of acute low back pain, 612 (62.8%) were male and 364 (37.2%) were female cases. Hence males were seemed to be more predisposed with female to male ratio of 1: 1.68. (Table-1)

**Table 1:** Distribution according to Demography and Duration of LBA

		No of case		Percentage	
		Male	Female	Male	Female
Age Group (in years)	0-20	06	00	2.72	0.00
	20-40	40	38	18.18	17.27
	40-60	78	22	35.45	10.00
	60-80	10	25	4.54	11.36
	>80	00	01	0.00	0.45
Occupation	Household work	26		11.81	
	Minimum manual work	18		08.18	
	Medium manual work	59		26.81	
	Heavy manual work	25		11.36	
	Farmers				

	Porters	37	16.81
	Labourers	19	08.63
	Office goers	27	12.27
	Others	09	04.09
Time (in months)	0-1	119	54.09
	1-3	83	37.72
	3-6	18	08.18

**Table 2:** Symptoms: Motor & Sensory (Neurological) Impairment

		No	Percentage
Symptoms	Back pain without leg pain	32	14.54
	Back pain with leg pain	188	85.45
	Paresthesia	119	54.09
	Numbness	117	53.18
	Neurological Claudication	53	24.09
	Bladder/Bowel involvement	5	02.27
Motor Level	Knee Flexor (L2-L3)	12	05.45
	Knee Extensor (L3-L4)	12	05.45
	Ankle Dorsiflexor (L4-L5)	58	26.36
	Ankle Plantarflexor (S1-S2)	19	08.63
	EHL (L5)	119	54.09
Sensory Level	Posterolateral thigh, anterior knee and medial aspect of Leg (L4)	26	11.81
	Anterior leg, dorsum of toe, great toe. (L5)	102	46.36
	Lateral malleolus & foot, heel and web of fourth & fifth toe (S1)	61	27.72
	Posterior aspect of thigh (S2)	15	06.81

**Table 3:** SLRT (Straight Leg Raising Test) & Laseague’s Test

SLR	Unilateral affected	Unilateral crossed	Bilateral
Positive	111	22	16
Negative	71		
Laseague’s test	Positive		137
	Negative		83

**Table 4:** Distribution of patients according to Modality of Treatment

S. No.	Treatment Modalities	Number of patient	Percentage
A.	<p>General</p> <ul style="list-style-type: none"> <li>Absolute Bed Rest for 2 weeks.</li> <li>Postural maintenance with pillow support below both Knees.</li> <li>Back Care</li> </ul>	To All Patients	100
B.	<p>Passive Modalities</p> <ul style="list-style-type: none"> <li>Heat or Ice application.</li> <li>Diathermy</li> <li>Light Massage</li> <li>Electrical Stimulation (TENS)</li> <li>Lumbar Traction</li> </ul>	220 67 178 46 23	100 30.45 80.90 20.90 10.45
C.	<p>Pharmacological Modalities</p> <ul style="list-style-type: none"> <li>Non-Steroidal Anti-inflammatory drugs.</li> <li>Muscle Relaxant.</li> <li>Neurotropics.</li> <li>Drugs for any specific condition</li> </ul>	194 62 138 26	88.18 28.18 62.72 11.81
D.	<p>Exercises (After relief of pain)</p> <ul style="list-style-type: none"> <li>Active Exercises</li> <li>Assisted Exercises</li> <li>Passive Exercises</li> <li>Flexion &amp; Extension exercises</li> <li>Stabilization Exercises</li> <li>Range of Motion Exercises</li> <li>Muscle Strengthening</li> <li>Specific Exercises</li> </ul>	197 19 119 153 151 199 153 37	89.54 08.63 54.09 69.54 68.63 90.45 69.54 16.81
E.	Epidural Medication	49	22.27
F.	Orthotic support	61	27.72
G.	<ul style="list-style-type: none"> <li>Re-assessment of patient</li> <li>Resumption of Duty</li> <li>Progression of Mechanical Program</li> <li>Modification of Working Diagnosis</li> <li>Preventive Education</li> <li>Clinical Assessment</li> </ul>	Done Specifically on all Patient	
H.	Re-assessment of patient at continuous interval of time	Of All Patients	

#### 4. Discussion

Out of the 220 patients studied we observed that maximum patients belonged to the upper lower class (38.17%) followed by lower class (16.81%), a finding that has been previously reported as well [9]. Our study showed that heavy manual worker (28.17%) were the most predisposed to acute low back ache followed by medium manual worker (26.81%). Among the specific occupation the porters (16.81%), lifting and walking with heavy weights were the most predisposed to acute lumbosacral syndrome followed by farmers (11.36%), office goers (12.27%) (Especially persons spending long hours over computers) and labourers (08.63%). Out of the total patients included in the study 54.09% presented with duration of 0-1 month of backache and 37.72% had a backache for 1-3 months and 8.18% for 3-6 months. Out of the 220 patients 85.45% patients presented with radiation of leg pain. All of the patients included in the study had radiating pain of variable duration, 54.09% patients had paresthesia, 53.18% patients had numbness of lower limbs, 24.09% of patients had neurological claudication and 2.27% patient had bladder and bowel involvement. Straight leg raising Test [10] was positive in 67.72% out of which 50.45% presented with unilateral positive passive SLR test, 10% as unilateral crossed and 7.27% presented with bilateral positive passive SLR test. Laseague's Test was also positive in 62.27%. 11.81% had a sensory impairment of L4 dermatome, 46.36% of L5 dermatome, 27.72% of S1 and 6.81% of S2 dermatome. 54.09% had involvement of extensor hallucis muscle. The other groups involved were ankle dorsiflexors, ankle plantar flexors, knee extensors, knee flexors in decreasing order of frequency. 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. After Epidural Medication 56.71% of patients had relief of pain [11], 51.45% had improved SLR, 36.73% of patients showed neurological improvement. After 1 month of Epidural Medication 81.47% patients showed decreased analgesic consumption but after 1 year only 59.68% 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, 4.43% of patients had pain doing routine activities, 11.24% of patients complained of pain even on slight exertional activity and 16.89% had pain only after >2hrs of exertional activity. 71.52% of patients were able to do normal routine and exertional activities [12].

#### 5. Conclusion

The main aim of low back pain treatment by conservative means should be the prevention instead of treatment by many drugs. A comprehensive examination of all patients of low back pain should be carried out before establishing the concrete diagnosis. Also, a proper regime of physiotherapy should be encouraged to facilitate muscle strength and tone and to increase the joint motion range. Once the acute stage has passed and the patient has been relieved of pain, proper training regarding the posture and body mechanics is very useful to enable the achievement of normal physical activity.

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