ISSN NO. 2320-5407

Journal homepage: http://www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH

RESEARCH ARTICLE

Analysis of validity of different tests in radicular low backache subjects

Ghazala Shahnaz[1], Ravinder Narwal[2]

1. PG. MPT, Department of Physiotherapy, HIPMS, HIHT University, Dehradun, U.K.India.

2. Lecturer, Department of Physiotherapy,HIPMS, HIHT University, Dehradun, U.K.India.

Manuscript Info

Manuscript History:

Received: 07 November 2013
Final Accepted: 21 November 2013
Published Online: December 2013

Key words:
SLR, CSLR and finger to floor test, RMDQ.

Abstract

Aim & objective:- Physical impairment test play important role in distinguishing painful structures and assess severity of the low back .The aim of this study is to find out validity of SLR, CSLR and finger to floor tests in radicular low backache patients. So that these tests can be used as diagnostic and prognostic test for radiating pain due to disc herniation and disability.

Methodology:- This experimental study was carried out with 30 subjects including both male and females with age 20-50 years at Physiotherapy OPD of Himalyan hospital. The data is collected by taking outcome variables in form of positive and negative result of SLR, CSLR and Finger to floor test in the form of VAS score, grading system & MRI reporting.

Protocol:- Self-reported disability according to RMDQ is taken for each patient.Then SLR test is followed by CSLR test followed by finger to floor test(FTF) is performed and VAS score for pain and grade for FTF is recorded .

Result:- SLR and Finger to floor test are significance test in diagnosis of disc herniation. CSLR is not significance in assessment of LBA.found . CSLR and FTF with grade 2 and less is highly significance test in diagnosis of extruded disc herniation.

Discussion & Conclusion:- SLR and FTF without grading system is highly sensitive test in radicular back pain but it not specific test for disc herniation. CSLR test is not a sensitive test but CSLR and FTF with grade (2or less than2) is highly specific test in diagnosing extruded disc herniation.

Introduction

Low back pain is defined as pain and discomfort, localized below the costal margin and above inferior gluteal fold, with or without leg pain. Pain in the low back can relate to the bony lumbar spine, discs between the vertebrae, ligaments around the spine and discs, spinal cord and nerves, muscles of the low back, internal organs of the pelvis and abdomen, and the skin covering the lumbar area[1] (Van Tulder M et al.2006).

Patients with LBP are a heterogeneous group, and in consequence the European Guidelines, suggest classification according to 3 categories: serious spinal pathology (ie, tumor, infection, fracture), radicular pain, and nonspecific LBP. Radicular pain is suggestive of neurogic involvement. Radicular pain is also known as sciatica. In almost 90% of cases sciatica is caused by disc herniation involving nerve root compression. (Manish Kumar et al,2011, David S.Gregory, MD et al. 2008).[2,3]

The Physical examination of patients with Low back pain, mainly physical impairment tests, along with relevant history and decreased range of motion play a very important role in assessment of low back pain with neural involvement. Most frequent used physical impairment tests are slump test ,SLR test, cross SLR test and finger to floor test[4,5] (Neblett R, Mayer TG et al. 2003, Flores L, Gatchel RJet al.1997.)

The slump test has been used to assess the altered neurodynamics. It is designed to assess abnormal mobility of tissues within the vertebral canal and intervertebral foramen including posterior discs. In this test the clinician judges whether reproduction occurs in response to different positions of the cervical spine, thoracic spine,lumbar spine and lower extremities[6]. Maitland G.(1985),

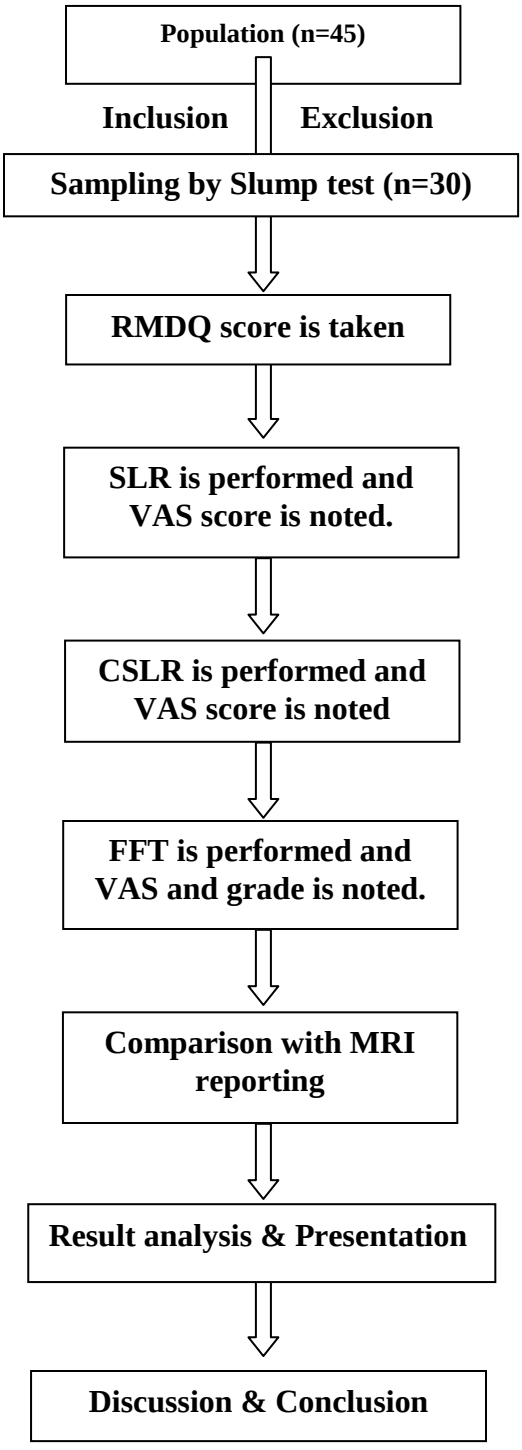
The SLR and cross SLR tests are specifically aimed at detecting lumbar nerve root irritation. They are common neurological tests[7,8](Jarvik JG, Deyo RA et al. 2002,Jönsson B, Strömqvist B.et al. 1995).
Range of motion assessment is an integral part of physical examination. And forward flexion is mostly affected in back pain patients. Forward flexion test has shown high sensitivity in back pain patients with radicular pain. Low back pain is a very common disorder. There are a number of physical impairment test present for the diagnosis of low back pain but there is lack of literature about a precise physical impairment test. The aim of our study is to find out the validity of SLR, CSLR and finger to floor test and thus find out a validated test for radicular low back pain.

Methodology:- This experimental was carried out with sample size of 30 subjects who have been selected from physiotherapy department of Himalayan hospital. Radicular backache subjects between ages 30 – 50 years with slump positive finding, body mass index between 18 - 29 kg/m^2, cooperative subjects were included in the study and all subjects with history of spinal surgery and trauma, spinal tumors, pregnancy**,** body mass index of more than 29 kg/m^2, systemic disorders. VAS, RMDQ score and MRI reporting were taken as outcome variables.

Procedure:- Subjects are selected on the basis of inclusion and exclusion criteria. Informed consent and ethical approval is taken .Self-reported disability according to RMDQ is taken for each patient and score was noted. Then clinical test were performed in the following order: 1) SLR 2) CSLR 3) finger to floor test (FFT) and VAS reading for pain is recorded for each performed test and grade of finger to floor test is noted. Then reporting of MRI was assessed and edited in data collection by Asst. Reseacher. Then subjects were instructed, educated about LBP rehabilitation program in the form of Mckenzie exercise and Core strengthening exercises.[9] (Mathew H.Liang, MD, MPH,et al.(1988)

Data analysis:- The data was analysed by the parametric t test and ANOVA. The intra group comparison was done with the help of mean and standard deviation analysis by paired t test by taking two values among groups. The significant level was set at $p \leq 0.05$ and confidence interval was 95%.

Flow chart for procedure:



Results:- Result of this study signifies the importance of SLR and FTF in diagnosis of mechanical LBP with radiation. The CSLR and FTF with grade ≤2 signifies there importance in the differentiation between mild disc prolapse and large disc prolapse (extrusion).

Table1:- Selection of sample conform by slump test for radicular back ache .

Groups	Mean±SD	T value	P value
Resting VAS	2.7±1.8	6.692	0.001
Slump VAS	5.6±2.2		

Table2:- Comparison of RMDQ score of MRI positive Mild prolapsed, Large prolapsed and Non MRI confirm group.

No.	Groups	Mean±SD	P value
I	MRI Mild Prolapse Group	11.33±4.84	0.542
II	MRI Large Prolapse Group	11.87±3.13	
III	Non MRI conform Group	13.28±4.02	

Table3:-Comparison among Resting VAS, SLR VAS, CSLR VAS, FFT VAS.

Groups	Mean±SD	F value	P value
Resting VAS	3.1±1.6	16.07	0.001
SLR VAS	6±1.8		
FFT VAS	5.8±2.0		

Significance level (p≤0.05)

Table4:- Comparison between Resting VAS and CSLR VAS in redicular back ache subjects.

Groups	Mean±SD	T value	P value
Resting VAS	3.1±1.6	1.989	0.056
CSLR VAS	3.5±1.9		

Significance level (p≤0.05)

Table5:-Comparison between Resting VAS and CSLR VAS of MRI diagnosed PIVD

Group	Mean±SD	T value	P value
Mild Prolapse	3.1±1.6	3.422	0.001
Large Prolapse	5.7±1.3		

Table6:- Comparison of Grade of FTF of MRI diagnosed PIVD with Mild prolapsed and large prolapsed group.

Groups	Mean±SD of Grade	T value	P value
Large Prolapse	1.83±0.98	4.292	0.001
Mild Prolapse	3.75±0.70		

Significance level (p≤0.05)

Fig.1: -Comparison of Mean±SD of CSLR VAS of Mild & Large PIVD diagnosed by MRI.

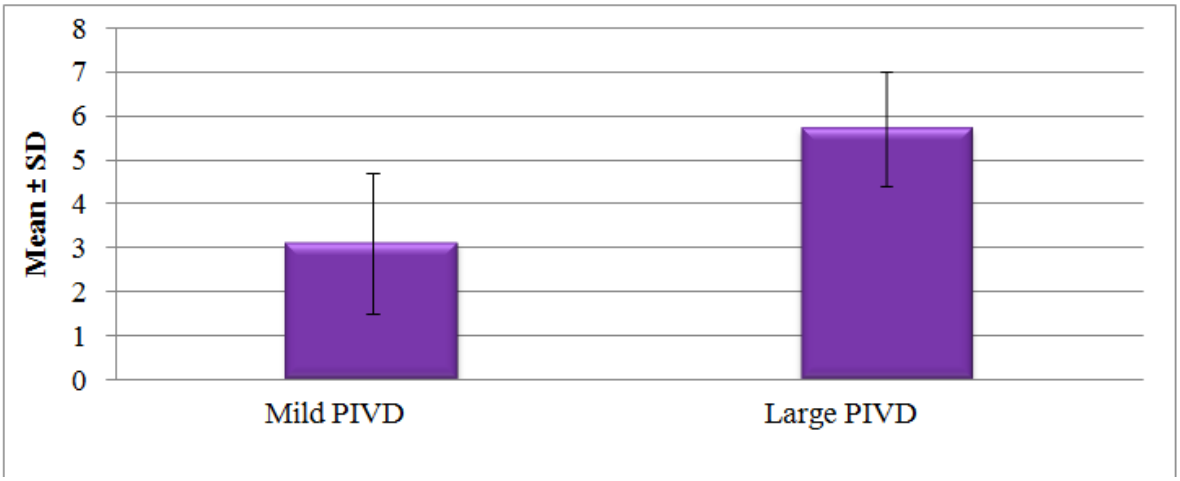
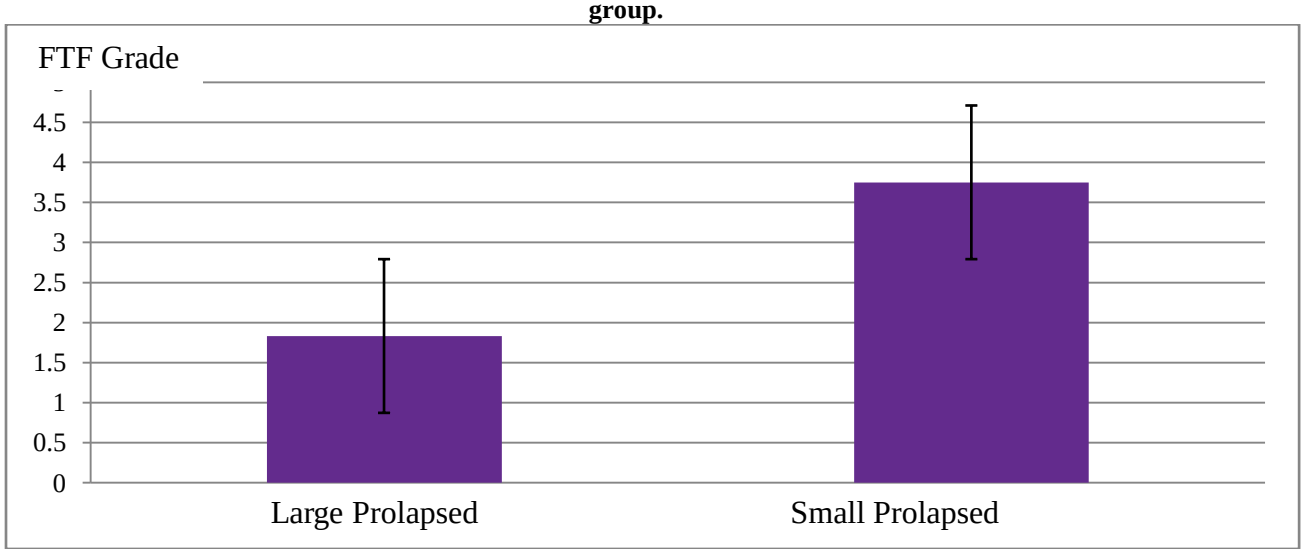


Fig. 2:- Comparison of Mean±SD of FTF grade of MRI positive mild prolapsed group and large prolapsed group.



Discussion:

Discussion of SLR

First finding of our study reveals that SLR is highly significant in subjects of radicular low backache that shows that this test is highly sensitive in assessment of radicular low back pain subjects. Jonsson B, et al.(1995) also stated that a positive SLR test is more common in lumbar disc herniation than in spinal stenosis. Van der Windt DA,et al.(2010) proved that SLR test yielded a high sensitivity i.e. 92% .This means that a negative SLR almost rules out a sciatic radiculopathy and disc herniation at L4-L5 and L5-S1 level[8,11].

Discussion of cross straight leg raising.

Second important finding of our study is that CSLR is not significant in subjects of low backache that shows that this test is not sensitive in diagnosis of radicular back pain. It has also been proved by many studies which revealed that sensitivity of CSLR test is low with a value of 22%. It may be sensitive in large prolapsed but it is not sensitive in small disc herniations.

But our study shows that specificity of CSLR is high as all the patients of MRI verified large prolapse disc i.e. extrusion give positive response to this test. Many researches has proved that CSLR is most definite clinical sign of disc herniation. Specificity of this test is also proved by Hudgins WR.(1979) who illustrate in his study that even mylography is unnecessary in diagnosis of disc herniation in patient with positive CSLR[12,13].

Discussion on forward flexion test

Result of our study shows that finger to floor test is sensitive test in LBP patients with radicular symptoms. This finding of our study is also supported by many other studies according to which finger to floor test has been shown to have a good reliability without the use of standardized instructions and patient positioning. Sullivan MS et al. (2000), also stated that finger to floor test had excellent reliability .Ekadahl et al.(2012) also support our study by concluding that finger to floor test has good validity in patients of low back pain with radicular symptoms[14,15].

Discussion on finger to floor test on the basis of grading system:-

Result of our study shows significant difference between grades of finger to floor test in MRI verified large disc herniations and MRI verified small disc herniation. But no significant difference in grades is found between MRI verified small disc herniations and grades of other subjects with radicular backache. Thus it is proved by our study that large prolapse verified by MRI reports have low grades of finger to floor test as compared with other subjects of radicular back pain and hence lesser grades of finger to floor test can contribute to assessment of disc herniation.

Discussion of MRI positive disc herniation group:-

First finding of this group shows that SLR test is a sensitive test in patient with disc herniation. This finding also suggested that SLR is a very sensitive test but not a specific test as it also shows high sensitivity in all patients of low backache with radicular symptoms. Van der Windt DA,et al.(2010)[11] also has proved in his study that SLR has low specificity for disc herniation i.e. only 28%. Spengler DM, Freeman CW,et al.(1979), suggested that a positive SLR has minimal value in differentiating a patient with herniated disc from other low back pain and sciatica. This proves that SLR is a sensitive test but not a specific test for herniated disc[16].

Finger to floor test has also shown its high sensitivity in patients with MRI verified herniated disc in our study. But this test also showed high sensitivity in all patients of low backache with radicular symptoms. So on the basis of this finding we can say that it is a sensitive test but not a specific test in disc herniation.

Discussion on Roland Morris Disability Score:-

Another important finding of our study shows that roland moris score have non significant difference between MRI and Non MRI group which suggest that Roland Morris Scale is highly sensitive by neural tissue involvement but it does not show significant difference between MRI verified disc herniation patients and other patients with radicular pain without MRI verification of the mechanical cause. Radicular pain could be produced from dynamic and chemical components as suggested by Ekedahl et al (2012) in his study[17,18,15].

Conclusion

The following study demonstrated the validity in terms of sensitivity and specificity of different tests i.e. SLR, CSLR and finger to floor test used in the diagnosis of disc herniation. Number of diagnostic test has been practiced for the diagnosis of disc herniation and but no test has been able to explain the grade of disc herniation .

On the basis of our discussion we have concluded that SLR and Finger to floor test are very sensitive test in cases of disc herniation and specificity of low grades of finger to floor test has also been found. CSLR is found to be less sensitive but highly specific test in diagnosis of large medially placed disc herniations and extruded disc herniations. It is also proved by our study that score of Roland Morris is highly influenced by neural tissue involvement but it is not specifically related with the severity of disc herniation.

Clinical relevance

Disc herniation is one of the important cause of radicular low backache. Confirm diagnosis of which require costly diagnostic procedures like magnetic resonance imaging(MRI) .Diagnostic field of physiotherapy will be expanded by using result of this study. So on the basis of this study it is strongly recommended by us to perform CSLR and Finger to floor test in the finding of grading of disc herniation before MRI prescription. Our study has proved that CSLR and grade 2 or more low grade of finger to floor test are specific test for large disc herniation and can be used as clinical diagnosis tools.

Future Research

Future research is necessary with a large sample size and MRI verified sample to determine the more accurate results. SLR grading on the basis of angle should be included in the procedure to find out the validity in terms of specificity of straight leg raising test.

Acknowledgement

We are thankful to all the members of HIPMS ethical committee for approving our clinical research. We are also thankful to all our subjects without support of whom we would not have been able to complete this clinical research.

Reference:

1. Van Tulder M et al.(2006) ,European guidelines for the management of acute nonspecific low back pain in primary care, Journal of Eur Spine vol 15,S169-S191.
2. Manish Kumar et al, (2011) Epidemiology, Pathophysiology and Symptomatic Treatment of Sciatica: A Review, International Journal of Pharmaceutical & Biological Archives,vol 4,1050-1061.
3. David S.Gregory, MD et al.(2008), Acute Lumbar Disk Pain: Navigating Evaluation and Treatment, Am Fam Physician, vol 78,835-842.
4. Neblett R, Mayer TG et al. (2003), Quantifying the lumbar flexion-relaxation phenomenon: theory, normative data, and clinical applications.Spine,vol 28,1435-1446.
5. Flores L, Gatchel RJet al.(1997), Objectification of functional improvement after nonoperative care, Spine,vol 22,1622-1633.
6. Maitland G.(1985),The slump test: examination and treatment, Aus J Phys,vol 31, 215-9.
7. Jarvik JG, Deyo RA et al. (2002), Diagnostic evaluation of low back pain with emphasis on imaging, Ann Intern Med,vol 137(7),586-597.
8. Jönsson B, Strömqvist B.et al. (1995), The straight leg raising test and the severity of symptoms in lumbar disc herniation: a preoperative evaluation, Spine,vol 20,27–30.
9. B W Koes, et.al.(2007),Diagnosis and treatment of sciatica, BMJ, vol 334(7607), 1313–1317.
10. Mathew H.Liang, MD, MPH,et al.(1988), Acute Low Back Pain: Diagnosis and Management of Mechanical Back Pain, Primary Care,vol 15,827-847.

11. Van der Windt DA,et al.(2010), Physical examination for lumbar radiculopathy due to disc herniation in patients with low-back pain, Cochrane database of systematic review,Feb 17;(2).
12. C. Farmer, C.J. McCarthy et al.(2012), What are the valid clinical tests in the diagnosis of a lunbar disc prolapsed, J Bone Joint Surg Br , vol. 94-B .
13. Hudgins WR (1979) ,The crossed straight leg raising test: a diagnostic sign of herniated disc, J Occup Med, vol 21(6),407-8.
14. Sullivan MS(2000), The relationship of lumbar flexion to disability in patients with low back pain, ,Phys Ther,vol 80(3),240-50.
15. Ekedahl H et al.(2012), Fingertip-to-floor test and straight leg raising test: validity, responsiveness, and predictive value in patients with acute/subacute low back pain, Arch Phys Med Rehabil. Vol 93(12),2210-15.
16. Spengler DM, Freeman CW,et al.(1979), Patient selection for discectomy, spine,vol 4,129-134.
17. Mannion AF, Dvorak J,A. et al. (2005), prospective study of the interrelationship between subjective and objective measures of disability before and 2 months after lumbar decompression surgery for disc herniation, Eur Spine J, vol 14,454-465.
18. Koc Z, Ozcakir et al. (2009), Effectiveness of physical therapy and epidural steroid injections in lumbar spinal stenosis, Spine,vol 34,985-989.