

Factors Associated with Lumbar Disc Herniation

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Introduction

Radicular leg pain can be a painful and debilitating condition that usually results from a lumbar disc herniation (LDH) and associated nerve root compression. The optimal criteria to diagnose a LDH still remains uncertain although recent research has suggested that a collection of patient signs and symptoms may form the most accurate model for predicting LDH on MRI.

Aim.

To identify demographic, subjective and examination variables that are associated with LDH in a group of patients with low back and/or leg pain of spinal origin.



Method

This was a retrospective, observational study that took place over a three year period. The sample group included all patients with back and/or leg pain that were assessed by a Physiotherapist, referred to a spine specialist, and subsequently received an MRI scan of the lumbar spine.

The exploratory variables recorded at the initial assessment included: pain score, age, employment status, symptom duration, perceived functional capacity, Straight Leg Raise (SLR) test result, neurological integrity and diagnostic pattern.

The independent variable was the finding of a LDH on MRI, as determined by a blinded radiologist and orthopaedic registrar.

Multivariate Logistic Regression analysis was then utilised to identify the exploratory variables that had a statistically significant association with a positive LDH.

References

Beattie P, Meyers S, Stratford P, Millard R, Hollenberg M. Associations between patient report of symptoms and anatomic impairment visible on lumbar MRI scanning. *Spine*. 2000; 7:819-828.

Vucetic N, Astrand P, Gunter P, Svensson O. Diagnosis and Prognosis in Lumbar Disc Herniation; *Clinical Orthopaedics and Related Research*. 1999; 361:116-122.

Sample Group

The final sample group comprised 155 patients with a mean age of 44 years. Of the 155 patients, 37 (23.9%) had symptoms of constant leg dominant pain, 4 (2.5%) had intermittent leg dominant pain and 114 (73.6%) back dominant pain.

Approximately half (77/155) of the sample group had a LDH confirmed on their lumbar spine MRI scan. Of the 77 cases with a LDH, 71 had a unilateral protrusion and 6 patients had a bilateral protrusion. Two patients had LDH at more than one level.

Symptom/Sign	p value	Symptom/Sign	p value
Sleep Disturbance	0.008*	Pain Score	0.403
Positive SLR	0.017*	Neurological Deficit	0.434
Age >45	0.049*	Leg Dominance	0.640
Smoking	0.203	Pain level	0.719
Symptom Duration	0.349	Working	0.859

* Statistical significance level set at $p < 0.05$

Statistical analysis

There was no statistically significant association between pain score, neurological loss, symptom duration, perceived function, dominant pain site and the eventual MRI finding.

Three variables recorded at assessment had a statistically significant association with a LDH:

1. sleep disturbance
2. positive straight leg raise
3. older age

Patients presenting with two of these variables had an odds ratio of 7.6 times and patients who had three of these variables were 8.8 times more likely to have a LDH on MRI scan compared to those that did not present with any of these signs.

Conclusion

Age, Sleep Disturbance and Straight Leg raise result are important factors for clinicians to consider when determining the cost/benefit of MRI to confirm a LDH.