Sensitivity of Laségue Sign and Slump Test in Hernia and Disc Bulging Diagnoses Compared with Magnetic Resonance Imaging*

Sensibilidade das manobras de Laségue e de slump nos diagnósticos de hérnia e abaulamento discal em comparação com ressonância magnética

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Abstract

Objective To show the accuracy of the most used maneuvers in the clinical diagnosis of lumbosciatalgia, the slump test and the Laségue sign.

Methods In order to perform the present study, 101 patients with magnetic resonance imaging (MRI) discopathy (gold standard) were selected and had their medical records reviewed to identify which had the positive maneuvers on the initial physical examination.

Results The sensitivity found for the slump test and the Laségue sign in the diagnosis of disc herniation was 55.3% and 18.1%, respectively. Nonetheless, when they were compared with each other for the diagnosis of disc bulging, the sensitivity obtained was of 85.7% for the slump test and of 28.6% for the Laségue sign.

Conclusion Comparing both clinical exams with MRI, it was found that the slump test presents superior sensitivity compared with the Laségue sign for both the diagnosis of hernia and disc bulging, and should be more present in clinical practice.

Keywords

- sensitivity and specificity
- lower back pain
- disc hernia
- radiculopathy

Resumo

Objetivo Mostrar a acurácia das manobras mais usadas no diagnóstico clínico da lombociatalgia, a manobra de *slump* e a de Laségue.

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Métodos Para a realização do presente estudo, foram selecionados 101 pacientes com discopatia na ressonância magnética (RM) (padrão ouro), sendo posteriormente realizada a revisão dos prontuários para identificar quais tiveram as manobras positivas no exame físico inicial.

Resultados A sensibilidade encontrada para as manobras de *slump* e Laségue no diagnóstico de hérnia discal foi respectivamente 55,3% e 18,1%. Já quando comparamos as manobras para o diagnóstico de abaulamento discal, a sensibilidade obtida foi de 85,7% para a manobra de *slump* e de 28,6% para a manobra de Laségue.

Conclusão Foi constatado que a manobra de *slump* apresenta sensibilidade superior à da manobra de Laségue tanto para o diagnóstico de hérnia quanto para o de abaulamento discal quando comparadas a RM, e deveria estar mais presente na prática clínica.

Palavras-chave
- sensibilidade e especificidade
- dor lombar
- hérnia discal
- radiculopatia

Introduction

Lumbosciatalgia is defined as pain that affects the lumbar spine intermittently and radiates in the path of the sciatic nerve in the lower limb, commonly affecting even the foot.[1]

Low back pain is among the main complaints that lead patients to seek medical attention. Around 70% of adults have low back pain at some point in life, and in 14% of cases, the pain lasts >2 weeks.[2] Patients usually seek care when this pain is recurrent and tends to radiate to one lower limb, more frequently, or to both limbs, with burning sensation, shock or paraesthesia in the specific dermatomes of the sciatic nerve. Among the roots that form the sciatic nerve, the most affected ones are L5 and S1.

Pain assessment and physical examination are fundamental for the diagnosis and treatment of the patient, thus the importance of being familiar with and knowing how to apply the maneuvers that evaluate the roots that make up the sciatic nerve, and the Laségue sign and the slump test are the methods of choice in the evaluation. For a better comprehension of these diagnostic tests, it is essential to understand the axis of motion of vertebral bodies, because this is the only way to understand why both tests are in flexion, since with the spine bent, there is compression in the roots,[3] allowing clinical suspicion. However, for the use of tests on physical examination to corroborate in patient care, it is necessary to know their ability to identify the individuals who truly have herniated nerve root compression or bulging in the levels that make up the sciatic nerve.

Once the pain is characteristic and physical examination suggests root compression, we can continue the investigation with more appropriate imaging. In the case of suspected nerve root compression, magnetic resonance imaging (MRI) is the most indicated test, because the root can be visualized and, thus, it will evidence the correct diagnosis through image visualization.

Considering this, the present study was developed to estimate the sensitivity of the Laségue and slump maneuvers, using magnetic resonance imaging as a comparative gold standard.

Material and Methods

For the present study, 130 medical records of patients undergoing follow-up of low back pain with lower limb irradiation were randomly selected. This pain was defined as pain located in the back in lumbar topography and radiating to either of the lower limbs or to both lower limbs in the dermatomes of the sciatic nerve. The follow-up of patients with this complaint is standardized by the authors in all their routine visits, by the performance of anamnesis and physical examination in every first consultation. This semiological evaluation includes the performance of the slump and Laségue maneuvers, and it is followed by imaging whenever the complaint is consistent with the diagnosis of lumbosciatalgia, with the examination of choice in these cases being MRI of the lumbar spine (gold standard). Of the 130 records initially selected, 29 were excluded during the evaluation because they did not meet the MRI criterion with diagnosis of hernia or bulging, while 101 patients were included because they presented these alterations in the imaging exam.

The present study compares the sensitivity of the slump and Laségue maneuvers in the diagnosis of hernia and bulging of intervertebral discs causing pain in the sciatic nerve path; for this reason, only patients who presented with any of these diagnosis in the MRI report were selected. In order to analyze the medical records retrospectively, the diagnosis presented on the RMI with were compared regarding the presence or not of positivity in each maneuver mentioned.

The slump test was performed with the patient sitting on the stretcher, with his legs hanging and his hands on his thighs; the examiner performed the flexion of the chest on the thighs and flexion of the cervical segment, approaching the chin to the sternum; then, with the other hand, the examiner held the plantar face of one of the feet and performed the knee extension and dorsal flexion of the foot, keeping the other leg pending and, afterwards, performed the same test with the lower contralateral limb.[4]

The Laségue sign, also applied bilaterally, was performed with the patient in the supine position, with the lower limbs extended on the stretcher; the examiner, placing one hand

on one of the heels of the patient, performs flexion of the thigh up to 60°, keeping the knee extended, in one limb at a time.[5,6]

Both maneuvers were considered positive only when, during their performance, the patient referred pain irradiated in the lower limb that manifested itself in the path of the sciatic nerve.

Regarding MRIs, they were all performed at the same site and in the same machine, and all the examinations were analyzed by the same radiologist. The examination reports of all those selected either had hernia or disc bulging.

In reference to the definition of hernia and bulging, a literature review was performed and, after an analysis of several articles, the authors opted for the definitions found in the work of Jensen et al.,[7] in which the authors differentiate hernia from bulging. In this study Jensen et al. differentiated the hernia as protrusion or extrusion of the pulpous nucleus; in the first case, the base of the rupture is smaller than the largest diameter of the outerized pulpous nucleus, while in the second case, the base of the rupture is larger than the largest diameter of the pulpous nucleus externalized out of the fibrous ring. However, in the present study, the authors will consider only the diagnosis of hernia, without differentiating the subtypes of Jensen et al. The definition of bulging is described by Jensen et al. as a distension of the disc in the transverse plane compressing the nerve root.

Results

There were 101 patients included, 62 (61.4%) of them were female and 39 (38.6%) were male, with ages ranging from 18 to 89 years old, with 94 (93.1%) diagnosed with hernia and 7 (6.9%) with bulging in the gold standard exam, suggesting a higher prevalence of diagnoses in patients with hernia (►**Table 1**).

During the review of medical records, it was found that 58 of the 101 patients presented a positive slump test, 40 on the right, 36 on the left, and 18 bilaterally, while 19 presented a positive Laségue maneuver, 13 on the right, 9 on the left, and 3 bilaterally. From this, it was possible to calculate the sensitivity of each maneuver in the diagnosis of intervertebral discs hernia and bulging.

In order to evaluate the sensitivity of the slump test in the diagnosis of disc herniation, the number of disc herniation diagnoses on MRI (94) was compared with the number of patients who had a positive slump test (52); therefore, if 94 is equivalent to 100% of the hernias, the 52 who had a positive maneuver are equivalent to 55.3%, and this is the sensitivity of the slump test in the diagnosis of disc herniation. To evaluate the sensitivity of the Laségue sign, the number of diagnoses of hernia in MRI (94) was compared with the number of patients who had a positive Laségue sign (17); therefore, if 94 is equivalent to 100% of the hernias, the 17 who had a positive maneuver are equivalent to 18.1%, which is the sensitivity of the Laségue sign in the diagnosis of herniated disc (►**Table 2**).

To calculate the sensitivity of the slump test in the disc bulging diagnosis, the number of disc bulging diagnosis in MRI (7) was compared with the number of patients who had a positive slump test (6); therefore, if 7 is equivalent to 100% of the bulging, the 6 who had a positive maneuver are equivalent to 85.7%, and this is the sensitivity of this maneuver in the diagnosis of disc bulging. To calculate the sensitivity of the Laségue sign in disc bulging diagnosis, the number of disc bulging diagnoses in MRIs (7) was compared with the number of patients who had a positive Laségue sign (2); therefore, if 7 is equivalent to 100% of the bulging, the 2 who had the positive sign are equivalent to 28.6%, and this is the sensitivity of this maneuver in disc bulging diagnosis (►**Table 3**).

Table 1 Division by gender of patients with discopathy

Variable	General ($n = 101$)	Female ($n = 62$)	Male ($n = 39$)
Age (years old)	53.2 ± 15.7 (18–86)	53.8 ± 16.3 (18–84)	52.1 ± 14.9 (18–89)
Discopathy			
- Hernia	94 (93.1%)	56 (90.3%)	38 (97.4%)
- Bulging	7 (6.9%)	6 (9.7%)	1 (2.6%)

Results described by means ± standard deviation (minimum - maximum) or by frequency (percentage).

Discussion

In the present study, it was found that the evaluated tests present significant sensitivity difference, and the slump test had a much greater capacity than the Laségue sign to detect patients who truly present hernia or disc bulging when compared with the gold standard test. This result reinforces the findings of Majlesi et al.,[8] who also found a statistical difference in the sensitivity of the maneuvers, also showing the greater efficacy in the slump maneuver when identifying the true positives.

However, it is worth remembering that these maneuvers are physical examination tests and, for this reason, they can vary a little from examiner to examiner and according to the pain threshold of each patient. It is also emphasized that both maneuvers, in this case mainly the slump maneuver, may be falsely positive in patients who have hamstring shortening. Therefore, it is important that the doctor can recognize well the dermatomes of the cyatic nerve, knowing how to differentiate the causes of pain that manifests itself posteriorly in the lower limbs.

Under this scenario it is suggested that both maneuvers be performed in the search for the most accurate diagnosis, and the slump maneuver is valued here, since its applicability brings more security to confirm the suspicion of hernia or disc bulging at the level of the roots of the sciatic nerve. It should also be emphasized that more studies are needed so that the clinical diagnosis, based on anamnesis and physical examination, is increasingly effective, bringing the patient's physician closer to the patient through propaedeutic, which is sometimes forgotten these days.

Table 2 Sensitivity of the slump test and of the Lasége sign in the diagnosis of disc herniation

	Maneuver	Side	Cases with alteration	Sensitivity	95%CI
Total ($n = 94$)	Slump	Right	34	36.2%	26.5%–45.9%
		Left	35	37.2%	27.5%–47%
		Bilateral	17	18.1%	10.3%–25.9%
		Right and/or left	52	55.3%	45.3%–65.4%
	Lasègue	Right	11	11.7%	5.2%–18.2%
		Left	9	9.6%	3.6%–15.5%
		Bilateral	3	3.2%	0%–6.7%
		Right and/or left	17	18.1%	10.3%–25.9%
Female ($n = 56$)	Slump	Right	18	32.1%	19.9%–44.4%
		Left	18	32.1%	19.9%–44.4%
		Bilateral	9	16.1%	6.5%–25.7%
		Right and/or left	27	48.2%	35.1%–61.3%
	Lasègue	Right	6	10.7%	2.6%–18.8%
		Left	5	8.9%	1.5%–16.4%
		Bilateral	2	3.6%	0%–8.4%
		Right and/or left	9	16.1%	6.5%–25.7%
Male ($n = 38$)	Slump	Right	16	42.1%	26.4%–57.8%
		Left	17	44.7%	28.9%–60.5%
		Bilateral	8	21.1%	8.1%–34%
		Right and/or left	25	65.8%	50.7%–80.9%
	Lasègue	Right	5	13.2%	2.4%–23.9%
		Left	4	10.5%	0.8%–20.3%
		Bilateral	1	2.6%	0%–7.7%
		Right and/or left	8	21.1%	8.1%–34%

Abbreviation: CI, confidence interval.

Table 3 Sensitivity of the slump and laségue maneuvers in the diagnosis of disc bulging

	Maneuver	Side	Cases with alteration	Sensitivity
Total ($n = 7$)	Slump	Right	6	85.7%
		Left	1	14.3%
		Bilateral	1	14.3%
		Right and/or left	6	85.7%
	Lasègue	Right	2	28.6%
		Left	0	0%
		Bilateral	0	0%
		Right and/or left	2	28.6%
Female ($n = 6$)	Slump	Right	6	100%
		Left	1	16.7%
		Bilateral	1	16.7%
		Right and/or left	6	100%
	Lasègue	Right	2	33.3%
		Left	0	0%

Table 3 (*Continued*)

	Maneuver	Side	Cases with alteration	Sensitivity
		Bilateral	0	0%
		Right and/or left	2	33.3%
Male (n =1)	Slump	Right	0	
		Left	0	
		Bilateral	0	
		Right and/or left	0	
	Lasègue	Right	0	
		Left	0	
		Bilateral	0	
		Right and/or left	0	

Conclusions

With the present work, we tried to transmit to the scientific community that the physical examination still has great value in the diagnosis, especially when the examiner knows the various maneuvers and understands their value in the suspicion of the pathology.

In the case of the slump test and of the Laségue sign, it was concluded, through a study with approximately 100 patients, that none of them have high sensitivity, but the first has a much greater capacity than the second to suggest the diagnosis of lumbosciatalgia in patients who actually have root compression evidenced as hernia or bulging on MRI.

Statement of Consent

I, José Luiz Pozo Raymundo, authorize the use of the medical records of my clinic to carry out scientific review work without the disclosure of the identity of the patients treated by me.

Conflict of Interests

The authors have no conflict of interests to declare.

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