Research Article

Sedimentation signal correlation and "Swiss spinal questionnaire" in lumbar stenosis

Abstract

Introduction: The spinal stenosis is the most common disease of the lumbar spine over 65 years. More specific symptoms are the progressive neurogenic claudicating, pain and muscle strength deficit started to walk. A form of clinical evaluation is performed by the "Swiss Spinal Stenosis Questionnaire" (SSSQ). An objective assessment can be made with sedimentation signal analysis seen by magnetic resonance imaging (MRI). The objective of this study is to correlate the clinical analysis through the SSSQ and sedimentation signal.

Methods: clinical trial, prospective, evaluating patients seen in the Workers' Hospital of the clinic from October 2014 to May 2015; with clinical evaluation and imaging. Excluded patients who had undergone previous surgery or who did not undergo MRI.

Results: 39 patients (25 men and 16 women). The mean age was 62,7years (46-87). The average score in SSSQ was 34.8 points corresponded to 66% of the maximum that could be obtained preoperatively (male average of 32.8 points - 65%; average female 37.9 points - 72%); 12 patients (30.76%) showed positive settling signal and 27 (69.23%) negative sedimentation signal. Patients with positive sedimentation signal had an average of 35.2 points and 37.1 points with a negative sign, with no significant difference between the data.

Conclusion: the degree of clinical impairment cannot be related to the presence of sedimentation signal.

Keywords: spinal stenosis, spine, questionnaires

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Introduction

Vertebral canal narrowing or vertebral stenosis is the most common pathology of the lumbar spine in people over 65 years of age reaching 8 to 11% of the population.[1] The most specific symptoms are progressive neurogenic claudicating accompanied by pain and deficit of muscular strengh initiated when walking.[2] Barz et al.[3] demonstrated that patients without vertebral stenosis submitted to magnetic resonance imaging (MRI) presented a migration of the roots to the dorsal region of the dural sac due to gravitational action, whereas in patients with vertebral stenosis they found images of the roots without this conformation, thus defining the first as a sign of sedimentation present and the second as a sign of absent sedimentation (Figure 1).[4,5]
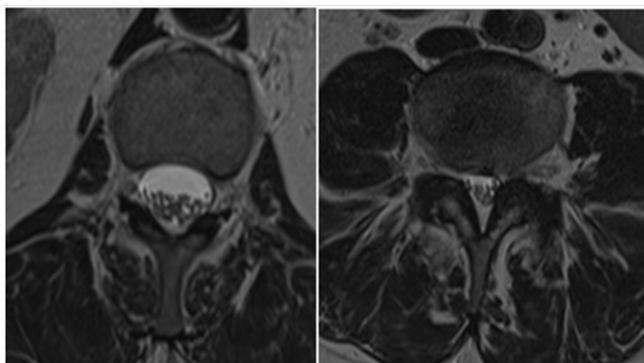
Figure 1 Left, present sedimentation signal. Right, Sign of sedimentation absent.

Patients with lumbar stenosis present variable clinical manifestations such as neurogenic claudication that manifests as a sensation of weight in the lower back radiating to the buttocks and lower limbs, numbness, weakness or burning; and sciatica as the most common complaints. Usually the symptoms do not accompany dermatomes, they are related to the physical activity and the patient adopts posture in flexion of the spine when wandering to decrease the complaints. Another feature is the decrease in the distances that the patient can go through as the lumbar stenosis progresses. The sciatica, however, manifests itself with compression of the nerve root in the lateral recess, being more common the root of L5, this is described in territory of myodermatomes. Stucki et al.[6] published a specific questionnaire for the clinical evaluation of vertebral stenosis, the Swiss Spinal Stenosis Questionnaire (SSSQ), which was validated for the Portuguese language by Azuga et al.[7] which allowed the measurement of symptoms.

The diagnosis is subjective and the symptoms are used as back pain with lower limb irradiation associated with heavy legs sensation, muscle weakness and parenthesis; and a radiological correlation of canal narrowing is sought. However, the intensity of these symptoms and the findings in the imaging studies are unknown. Having within reach this clinical questionnaire and the image found in the MRI of the "sedimentation signal"; we looked for in this study to observe the existence of specific radiological-clinical correlation, since in the literature there is no such reference.

Material and methods

Study approved by the Committee of Ethics and Research of the *Hospital do Trabalhador*. This is a prospective clinical study conducted between October 2014 and May 2015 in which patients were selected by the researchers at the outpatient surgery service of the *Hospital do*

Trabalhador, located in Curitiba-PR/Brazil, who presented symptoms of stenosis who underwent MRI examination. The image obtained in MRI, T2-weighted in the axial cut at the level of the L4 transverse processes, was classified as "present sedimentation signal" (Figure 1) and "absent sedimentation signal" (Figure 1). To these patients, a direct application of SSSQ was performed, restricting the preoperative questions, in order to quantify their clinical symptoms. The total value that could be obtained when the pre-treatment questions are applied is 53 points that correlate with 100% of the value that could be obtained by the patient with all symptoms with maximum manifestation. Clinical data and imaging examinations were analyzed by 8 spine surgeons and 2 radiologists, and their cross-results were evaluated for direct correlation. For the analysis of results were used the means between the groups "SSSQx Sex" and "SSSQx Sedimentation signal" were compared through a one-way ANOVA. The correlation between the SSSQe and age variables was compared through a simple linear regression analysis. The assumptions of homoscedasticity and normality were verified through the tests of Levene and Shapiro-Wilk, respectively. Values of $p<0.05$ were considered significant. Patients who underwent previous surgical procedures in the lumbar spine, who did not agree with the consent term or were unable to undergo MRI, were excluded from the study. Two patients were excluded because they did not present an image examination with sufficient quality to evaluate the sedimentation signal.

Results

Thirty-nine patients were included in the study and each was assigned an identification number as they were included in the study; of these 23 men and 16 women. The mean age was 62,7years (46-87), and the mean age of the women was 65,6years (59-74) and of the men 62.5years (46-86). The average score was 34.8 points, corresponding to 66% of the maximum that could be reached, with the male average being 32.8 points -65% - and the female average being 37.9 points - 72%. The present sedimentation signal was observed in 12 patients (30.76%), who presented a mean of 66.41% of points in the SSSQ signal of sedimentation absent in 27 patients (69.23%) with a mean of 70% of points in the SSSQ. The values of SSSQ among male and female patients did not present significant differences (Figure 2). The values of SSSQ did not present significant correlation with the age of the patients. SSSQ values among the groups of patients with or without the signal did not present significant differences (Figure 3).
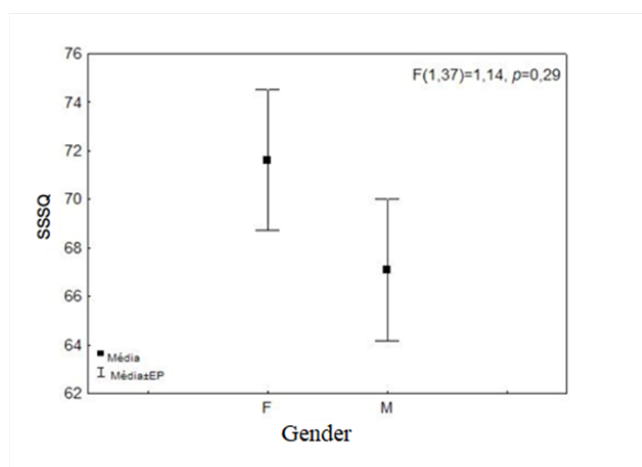
Figure 2 Relationship between the mean of points obtained in the QSSS between male and female patients.
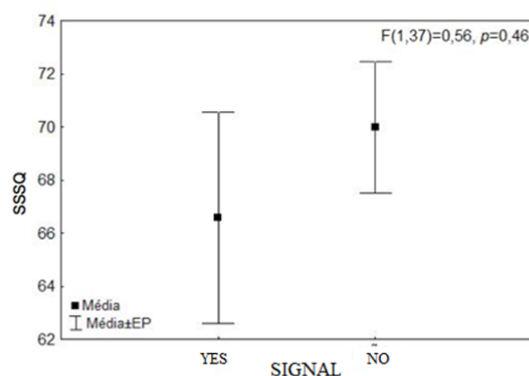
Figure 3 Relationship between the mean points obtained in the QSSS and the presence or absence of the sedimentation signal.

Discussion

We found a mean age of 63 years and a higher prevalence of males; less than 65 years and female sex as found in the literature.[1] Age was not significant in the intensity of symptoms. Barz et al.[3] found that 94% of the patients had no sedimentation signal, while our data indicated 69.23%, approaching the data found by Laudato et al.[8] of 30% of the patients presenting the signal. The quantification of symptoms in lumbar canal stenosis through quality of life questionnaires are used to measure the existing limitations in diagnosis and what may be of clinical improvement in the implementation of treatments. The absent sedimentation signal observed in MRI images of the spine serves as a guide to investigate complaints related to decreased lumbar spine amplitude but should not be used exclusively for the diagnosis of lumbar stenosis. The absence of significance between the Swiss Spinal Stenosis Questionnaire score and the sedimentation sign shows that there is no imaging test capable of replacing the clinical diagnosis both in the presence and intensity of the complaints related to the limitations imposed by the pathology.

Conclusion

Anamnesis and physical examination remain the gold standard for the diagnosis of lumbar canal stenosis. The use of the sedimentation signal is not indicated for diagnosis or quantification of symptoms in the lumbar canal stenosis; however it is a finding that directs the physician in the investigation of the disease.

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None.

Conflict of interest

Author declares that there is no conflict of interest.

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