

# Awareness and use of diagnostic support tools for lumbar spinal stenosis in Japan

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## Abstract

**Background** Lumbar spinal stenosis (LSS) is a major clinical problem associated with back pain, intermittent claudication, leg pain, and leg numbness. Diagnostic support tools for LSS such as the self-administered, self-reported history questionnaire (SSHQ) and developmental clinical diagnosis support tool (ST) have been validated in Japan. However, the degree of awareness and use of these two diagnostic support tools for LSS in Japan has not been clarified. The aims of the current study were to determine the degree of awareness and use of these two diagnostic support tools by Japanese physicians. Furthermore, we compared these results among nonorthopedic general practitioner (GP), orthopedic GP, and hospital-based orthopedic physicians.

**Methods** The LSS Diagnosis Support Tool (DISTO) Project was conducted to evaluate the degree of awareness and use of these two diagnostic support tools in Japan from 2011 to 2012. A total of 1,811 answers were obtained from physicians including nonorthopedic general practitioners (GP), orthopedic GPs, and hospital-based orthopedic

physicians. Questions were (1) Do you know about these two diagnostic tools? and (2) If you know about these two diagnostic tools, have you used them?

**Results** The degree of awareness of ST and SSHQ was about 30 and 26 % by nonorthopedic GPs, 70 and 46 % by orthopedic GPs, and 68 and 41 % by hospital-based orthopedic physicians. The degree of awareness of ST and SSHQ by nonorthopedic GPs was significantly lower than by orthopedic GPs or hospital-based orthopedic physicians ( $p < 0.001$ ). For physicians who were aware of ST and SSHQ, the degree of use of ST or SSHQ was <50 % by nonorthopedic GPs, orthopedic GPs, and hospital-based orthopedic physicians.

**Conclusions** We expect that use of the ST or SSHQ tools in primary care will improve the accuracy of diagnosis and lead to improved quality of patient care. The low proportion of awareness by nonorthopedic GPs (<30 %) and use by all physicians (<50 %) indicate a need to encourage physicians to use ST and SSHQ more frequently.

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For the DISTO-project group. Members of the research groups are listed in the Appendix.

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## Introduction

Compression of spinal nerve roots by lumbar spinal stenosis (LSS) is a major clinical problem associated with intermittent claudication, pain, numbness, and lack of normal sensitivity. Such compression has been shown to induce neurophysiological dysfunction, degeneration, and reduced blood flow in nerve roots in animal models and humans [1, 2]. One major difficulty in performing any epidemiological analysis is the absence of universally accepted diagnostic criteria for spinal stenosis [3]. Magnetic resonance imaging (MRI) and computed tomography (CT) are the most frequently used diagnostic modalities in

clinical practice. However, diagnosis made solely by diagnostic imaging may lead to errors because CT and MRI are often not specific, meaning that these imaging techniques identify anatomical variants that often are not clinically relevant [4, 5].

The patients' symptoms, response to specific questions, and findings on physical examination are effective for diagnosing LSS in the clinic. A useful clinical support tool may assist primary care physicians to identify patients with LSS. The findings by such tools combined with CT and MRI would improve the rate of diagnosis of LSS. Indeed, the Degenerative Lumbar Spinal Stenosis Work Group of the North American Spine Society's Evidence-Based Clinical Guideline Development Committee has recently recommended the use of the most appropriate historical and physical findings consistent with the diagnosis of degenerative LSS [6]. A diagnosis of LSS may be considered in older patients presenting with a history of gluteal or lower extremity symptoms exacerbated by walking or standing, which improve or resolve with sitting or bending forward [7–10]. Patients whose pain is not made worse with walking have a low likelihood of stenosis [7–10].

Konno et al. [7] have validated a diagnostic support tool for lumbar spinal stenosis: a self-administered, self-reported history questionnaire (SSHQ) and a developmental clinical diagnosis support tool (ST) for evaluation and diagnosis of LSS patients in Japan [8]. However, the degree of awareness and use of these two diagnostic support tools in Japan have not been clarified.

The aims of the current study were to determine the degree of awareness and use of these two diagnostic support tools in Japanese physicians. Furthermore, we compared these results among nonorthopedic general practitioner (GP), orthopedic GP, and hospital-based orthopedic physicians.

## Materials and methods

### Data collection from physicians

The survey of the lumbar spinal stenosis Diagnosis Support Tool (DISTO) project was a multicenter cross-sectional study. The DISTO-project survey was conducted under the guidance of the Japanese Society for Spine Surgery and Related Research. The research group consisted of DISTO project members. The DISTO project was conducted to evaluate the degree of awareness and use of these two diagnostic support tools for LSS in Japan from 1 December 2011 to 31 December 2012. A total of 1,811 answers were obtained from physicians. The collection rate was 85 %. Physicians included nonorthopedic GPs, orthopedic GPs, and hospital-based orthopedic physicians. SSHQ and ST are shown in Tables 1 and 2. The ethics committees of all

**Table 1** Clinical diagnosis support tool to identify patients with lumbar spinal stenosis [8]

|                                                             |          |           |         |
|-------------------------------------------------------------|----------|-----------|---------|
| History                                                     |          |           |         |
| Age (years)                                                 | <60 (0)  | 60–70 (1) | >70 (2) |
| Diabetes                                                    |          | + (0)     | – (1)   |
| Symptoms                                                    |          |           |         |
| Intermittent claudication                                   | + (3)    | – (0)     |         |
| Exacerbation of symptoms when standing up                   | + (1)    | – (0)     |         |
| Symptom improvement when bending forward                    | + (3)    | – (0)     |         |
| Physical examination                                        |          |           |         |
| Symptoms induced by having patients bend forward            | + (–1)   | – (0)     |         |
| Symptoms induced by having patients bend backward           | + (1)    | – (0)     |         |
| Ankle brachial index                                        | ≥0.9 (1) | <0.9 (0)  |         |
| Decline or disappearance of abnormal achilles tendon reflex | + (1)    | – (0)     |         |
| SLR test positive                                           | + (–2)   | – (0)     |         |

If the total score is more than 7, the patient has a high possibility of lumbar spinal stenosis

**Table 2** Diagnostic support tool for lumbar spinal stenosis: a self-administered, self-reported history questionnaire (SSHQ) [7]

|                                                                          |                                                                                                          |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Q1                                                                       | Numbness and/or pain in the thighs down to the calves and shins                                          |
| Q2                                                                       | Numbness and/or pain increases in intensity after walking for a while, but are relieved by taking a rest |
| Q3                                                                       | Standing for a while brings on numbness and/or pain in the thighs down to the calves and shins           |
| Q4                                                                       | Numbness and/or pain is reduced by bending forward                                                       |
| The key questions for diagnosis of cauda equina symptoms were as follows |                                                                                                          |
| Q5                                                                       | Numbness is present in both legs                                                                         |
| Q6                                                                       | Numbness is present in the soles of both feet                                                            |
| Q7                                                                       | Numbness arises around the buttocks                                                                      |
| Q8                                                                       | Numbness is present, but pain is absent                                                                  |
| Q9                                                                       | A burning sensation arises around the buttocks                                                           |
| Q10                                                                      | Walking nearly causes urination                                                                          |

institutions approved the protocol for the human procedures used in this study, and informed written consent was obtained from each subject.

### Questions

(1) Do you know about these two diagnostic tools?

(1) I am aware of both diagnostic tools. (2) I am only aware of ST. (3) I am only aware of SSHQ. (4) I am not aware of either diagnostic tool.

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