

Walking Distance as a Measure of Disability in Lumbar Spinal Stenosis

Hurri H¹, Sainio P², Kinnunen H³, Kankare J³, Heliövaara M², Slätis P¹, Malmivaara A⁴
and the Finnish Spinal Stenosis Study Group

ORTON, The Orthopaedic Hospital and Rehabilitation Centre, Helsinki¹
National Public Health Institute, Department of Health and Functional Capacity, Helsinki²
Department of Orthopaedics and Traumatology, Helsinki University Hospital, Helsinki³
Finnish Office for Health Technology Assessment, National Research and
Development Center, FinOHTA/Stakes, Helsinki⁴

Background

Since neurological claudication is a major symptom in lumbar spinal stenosis (LSS), walking distance is commonly used as a measure of the severity and surgical outcome in LSS. Information on walking capacity is often based upon patients' self-report. Walking capacity measurement has been used even as a diagnostic tool in the differential diagnosis of lumbar spinal stenosis (LSS) (1). The important basic question is, how reliable and valid is the patient's self report about the walking capacity. This study is addressing this issue.

More specifically, the purpose of this study was to clarify the following questions:

- 1) What is the agreement between self-reported and treadmill-based walking capacity?
- 2) Are these measures reproducible over a six months' period?
- 3) Does the self-reported walking distance correlate with patients' self-assessed functional capacity?

Methods

A randomized controlled trial assessing the effectiveness of surgical treatment on LSS was conducted in four university hospitals (2). Altogether 94 patients were randomized in surgical (n=50) or conservative (n=44) treatment. The patients' functional capacity, including walking capacity, was assessed at baseline, and at 6, 12, and 24 months' follow-ups. Walking capacity was examined by self-report and walking test

on a treadmill. In the questionnaire the walking ability was asked as follows: "What distance are you able to walk on even ground without resting?". The treadmill test was conducted by physiotherapists according to written instructions. After a short period of familiarizing the patients with walking on a treadmill, the speed was set at 2.5 km/h. The test was ended at a point when a patient did not want to go on because of pain, fatigue, weakness in legs, a combination of these, or after 30 minutes (1250 meters). Oswestry Disability Index, ODI (3) was used to assess the patients' self-reported functional capacity.

Data analysis

A kappa coefficient was used to describe the agreement between self-reported and test-based walking capacity. Intraclass correlation coefficient was used to analyse the association of ODI and walking capacity, as well as the reproducibility of the walking test results over six months' period among the patients in the conservative treatment.

Results

For walking distance categorized as below 400, 400 to 1249 and 1250 meters and over, there was a fair agreement between self-report and treadmill test (overall Kappa 0.43, Table 1). Among the 44 patients in conservative treatment, the treadmill-measured walking distance was more reproducible after six months than the self-reported distance; the intra-class correlation coefficients were 0.75 and 0.41, respectively. The self-

reported walking distance correlated with ODI at base-line ($r=0.26$), and changes in these outcomes from randomization to the follow-up of six months showed a strong correlation with each other (0.37).

Discussion

Walking distance is an important measure of disability in LSS. In the earlier studies, the reliability of the walking test among spinal stenosis patients have been reported to be high (4), but as far as the authors know, no comparison between subjective and objective measurement of the walking ability has been made so far. In this study the treadmill measurement turned out to be more reproducible than the subjective evaluation of walking ability. These observations slightly favor the measured walking ability in terms of validity over the self-reported evaluation among the spinal stenosis patients. It has to be pointed though that there is a lot of fluctuation among LSS patient's symptoms, which inevitably hampers the results of reproducibility.

The self-reported walking ability correlated quite weakly ($r=0.26$) to the perceived disability (Oswestry Index) at the base-line, but the changes in these outcomes correlated more strongly ($r=0.37$) over the six months follow-up. In the present study, self-report and performance test yielded quite distinct information on walking capacity, and therefore they complement each other in the assessment of LSS patient.

Wittink et al. (5) drew similar conclusions based on a study of chronic, unspecific low back pain pa-

tients. They state that "self-report measurements and performance-based assessments provide information about distinct, although related, domains of physical functioning." Our and their results confirm each other: self-report measures require supplementation with objective performance testing to provide optimal assessment for patients with CLBP, including spinal stenosis patients.

It is worth remembering that the spinal stenosis is a multifaceted syndrome, and the overall functional capacity assessment or looking for predictors to the development of spinal stenosis patients has to include other assessments beyond the walking capacity. In a systematic review by Aalto et al. (6) it was found that depression, cardiovascular comorbidity, disorder influencing walking ability, and scoliosis predicted poorer subjective outcome. Better walking ability, self-rated health, higher income, less overall comorbidity, and pronounced central stenosis predicted better subjective outcome. Male gender and younger age predicted better post-operative walking ability. The authors conclude that the predictive value may be outcome specific; thus, the use of all relevant outcome measures is recommended when studying predictors of LSS. We believe that this holds true for any evaluation of LSS. This also calls for a general framework for functional evaluation, where the ICF-model (7) can make a contribution.

Table 1. Agreement of the self-reported and measured walking distance.

Self-reported walking distance	Measured walking distance		
	below 400 m	400–1249 m	1250 m and over
below 400 m	18	6	3
400–1249 m	10	7	20
1250 m and over	1	4	22
<400 m, kappa (95% CI) P-value for symmetry	0.48 (0.29-0.68) 0.65		
>1250 m, kappa (95% CI) P-value for symmetry	0.38 (0.21-0.57) 0.0007		
Overall kappa (95% CI) P-value for symmetry	0.43 (0.29-0.56) 0.005		

Kirjallisuus:

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