

Clinical Study

Back pain, neurogenic symptoms, and physical function in relation to spondylolisthesis among elderly men

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Abstract

BACKGROUND CONTEXT: Degenerative spondylolisthesis is a presumed cause of back pain. Previous studies of spondylolisthesis and back pain included only women or combined results for men and women. Comparisons of the frequency of back pain, neurogenic symptoms, and functional limitations specifically among elderly men with and without spondylolisthesis are needed.

PURPOSE: To determine associations of prevalent spondylolisthesis with back pain symptoms, neurogenic symptoms, and functional limitations among elderly men.

STUDY DESIGN/SETTING: Cross-sectional epidemiologic study conducted within the Osteoporotic Fractures in Men (MrOS) cohort. The MrOS cohort is composed of 5,995 community-dwelling men aged 65 years or older who were recruited at six US academic medical centers. Extensive self-reported data and lumbar spine radiographs were obtained for all MrOS participants at baseline.

PATIENT SAMPLE: For this study, 300 men were selected at random specifically for the evaluation of spondylolisthesis on the baseline spine radiographs.

OUTCOME MEASURES: Standardized questionnaires were used to assess self-reported back pain, leg pain (radiculopathy), lower extremity numbness (paresthesias), and lower extremity weakness occurring in the past 12 months and to ascertain current difficulty with activities of daily living.

METHODS: In the present study, radiographic spondylolisthesis was classified as forward slip of $\geq 5\%$. Prevalence of back pain, neurogenic symptoms, and difficulty with activities of daily living was compared between men with and without spondylolisthesis using chi-square or Fisher exact tests.

RESULTS: Spondylolisthesis was present among 92 (31%) men. Among men with and without spondylolisthesis, back pain (63% vs. 67%, $p=.46$) and moderate/severe back pain (41% vs. 38%, $p=.76$) were reported with similar frequency. Men with spondylolisthesis more often reported radiculopathy (33% vs. 22%, $p=.06$), paresthesias (18% vs. 11%, $p=.10$), and weakness (18% vs. 9%, $p=.02$) in the lower extremities, as well as difficulty walking two to three blocks (21% vs. 11%, $p=.03$), doing their own shopping (8% vs. 2%, $p=.04$), and getting in/out of a car (14% vs. 6%, $p=.03$), compared with men without spondylolisthesis.

FDA device/drug status: not applicable.

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CONCLUSIONS: Among elderly men, spondylolisthesis was associated with neurogenic symptoms and lower extremity functional limitations; however, spondylolisthesis was not associated with a higher likelihood of back pain in this population. © 2010 Elsevier Inc. All rights reserved.

Keywords: Spondylolisthesis; Back pain; Neurogenic symptoms; Physical limitation; Male

Introduction

Spondylolisthesis is defined as an anterior migration, or slip, of a vertebral body in relation to the vertebra located immediately caudad. Five categories of spondylolisthesis have been described including dysplastic, isthmic, traumatic, pathologic, and degenerative [1]. Degenerative spondylolisthesis is characterized by an intact vertebral ring [2,3], is presumed to result from degeneration of facet joints and intervertebral discs with aging [1,2], and has traditionally been considered to represent instability of the vertebral segment [2]. This condition is common among middle-aged and elderly adults with prevalence estimates in US cohorts ranging from 14% to 30% [4–7].

The amount of forward slippage is of clinical concern because it can cause spinal stenosis and nerve root compression. Low back pain and pain, numbness, or weakness in the legs or lower extremities are symptoms clinically associated with degenerative spondylolisthesis [8,9]. Because of its putative relation to back and leg pain symptoms, degenerative spondylolisthesis is often considered an indication for surgery. In the United States, more than 300,000 lumbar spine fusion surgeries (or arthrodesis) are performed annually, and one-third of these are for degenerative spondylolisthesis, spinal stenosis, or a combination of both [10,11]. The numbers of lumbar spine fusion surgeries have steadily risen in the past 20 years, as has the trend toward utilization of instrumentation to achieve fusion [11–13].

Despite the numbers of surgeries performed for degenerative spondylolisthesis, information is lacking about the relation of radiographic spondylolisthesis to back pain symptoms and to physical functioning. Several studies have included only symptomatic individuals with spondylolisthesis [2,14–16], making it difficult to discern if the frequency of symptoms differs from that among persons without spondylolisthesis. Large cohort studies that are able to compare symptom prevalence among those with and without spondylolisthesis indicate that the frequency of self-reported back pain in the previous 12 months is similar among adults with and without degenerative spondylolisthesis [4–6,17]. However, none of these studies assessed leg symptoms. Therefore, whether neurogenic symptoms are more prevalent among adults with degenerative spondylolisthesis compared with those without this condition has not been established. Moreover, although back pain and neurogenic symptoms increase the likelihood of activity limitations among the elderly [18–20], few studies have investigated the effects of spondylolisthesis on physical functioning [4,5].

Previous reports about the association of degenerative spondylolisthesis with back pain among community-dwelling

adults have been limited to only women [5] or to men and women combined [4,6,17]. To investigate this association among men, we conducted a cross-sectional study in a sample of participants in the Osteoporotic Fractures in Men (MrOS) study, a cohort of US men aged 65 to 100 years. We addressed the following questions. Compared with men without spondylolisthesis, are men with spondylolisthesis more likely to report back pain; more likely to report neurogenic symptoms; and/or more likely to report difficulty with activities of daily living (ADL)? A comprehensive assessment of spondylolisthesis prevalence and its association with demographic factors, body size, and physical activity is reported elsewhere [7].

Methods

Parent cohort

The MrOS study enrolled 5,995 participants from March 2000 through April 2002 as described elsewhere [21,22]. Briefly, recruitment occurred at six US academic medical centers in Birmingham, AL; Minneapolis, MN; Palo Alto, CA; Pittsburgh, PA; Portland, OR; and San Diego, CA. Eligible participants were at least 65 years of age, community dwelling, able to walk without assistance from another person, and had at least one natural hip for bone density measurement. Eligibility criteria were minimal so that results from the cohort would be applicable to a broad population of community-dwelling men with similar ages [21]. Institutional review boards at each center approved the study protocol. All the participants provided written informed consent.

At baseline, all men completed a comprehensive self-administered questionnaire and attended a clinic visit, where thoracic and lumbar radiographs were obtained using a standardized protocol for the ascertainment of vertebral fracture. Men were placed on their left side in the lateral position with legs flexed and both arms at right angles to the body. The long axis of the spine was set parallel to the table and the midaxillary (coronal) plane of the body was aligned to the table midline. Images were obtained from T12 to S1. All films were sent to the MrOS San Francisco Coordinating Center for central quality review, processing, digitization, and archiving.

Selection of the study sample

To establish initial data on spinal conditions other than vertebral fracture in the cohort, 300 participants were randomly sampled using a computer-generated random

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