Low Back Pain Increases the Risk of Falling Among Elderly Men
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ABSTRACT INTRODUCTION:
Back pain is common among elderly persons. Nearly 30% of US adults aged ≥65 years reported back pain lasting at least 1 day in the past 3 months. Notably, in this population, back pain accounts for a greater proportion of variation in physical health status than age or demographic factors. Accidental falls are also a major public health problem among the elderly. From 20%-36% of US adults ages 65 years and older reported a fall in the past year and 16% reported a fall in the past 3 months. Because limitations in physical functioning increase the risk of falls, we reasoned that back pain may be a risk factor for falls. To test this hypothesis, we used data collected in the Osteoporotic Fractures in Men (MrOS) cohort, a prospective study of risk factors for falls and fractures among 5995 community-dwelling men ages 65-100 years.

METHODS:
Enrollment in MrOS occurred from 2000-2002 at 6 US academic medical centers. The Institutional Review Board at each center approved the study protocol. At enrollment, all men gave written informed consent, completed an extensive self-reported questionnaire and attended a clinic visit. Low back pain in the past 12 months, pain severity and leg pain going “down into the buttock, leg or foot” (radiculopathy) were self-reported. Other baseline information included: demographic factors; medical history including heart disease, diabetes, stroke, arthritis, and clinical spine fracture; history of falls before enrollment; lifestyle choices including smoking, alcohol consumption, and the physical activity scale for the elderly (PASE); 12-Item Short Form Health Survey (SF-12) physical (PCS) and mental component scores (MCS); and mobility limitations (difficulty walking 2-3 blocks or climbing up 10 steps). Objective physical function measures were usual walking pace over 6 meters, time to complete 5 chair stands, and grip strength. Height and weight were measured by clinic staff and used to compute body mass index (BMI) (kg/m²). Prescription medications were recorded from labels on containers the men brought to the visit.

During follow-up, numbers of incident falls were reported on questionnaires mailed every four months. Over 99% of the questionnaires expected were completed in each interval. We summed the number of falls reported by each man within 1 year of his enrollment date. Two binary fall outcomes were studied: any fall (≥1 fall vs. 0 falls) and recurrent falls (≥2 falls vs. 0-1 fall).

For analysis, men were excluded if their back pain was usually in the midback, upper back, or neck (n=189), they reported Parkinson’s disease (n=50), they died before the first follow-up interval (n=9), or they were missing information on falls during follow-up (n=54). Risk ratios (RR) were used as the measure of association between back pain symptoms and 1-year risk of falls. RRs were computed as the 1-year risk of falls among men in a particular back pain category divided by the 1-year risk of falls among men with no back pain. Multivariable log binomial regression was used to estimate RRs and 95% confidence intervals (CI). RRs above 1.0 (the null) denote an increased risk of falls and are statistically significant at the α=0.05 level if the 95% CI excludes 1.0.

During variable selection, RRs were first adjusted for age. Then all remaining variables from the list above were evaluated as potential confounding factors. Variables that changed the RRs by ≥10% were defined as confounders and retained in the model. Based on this selection procedure, the RRs were adjusted for age, history of falls before enrollment, use of any central nervous system (CNS) active medication (benzodiazepine, non-benzodiazepine anticonvulsants, narcotic analgesics, selective serotonin reuptake inhibitors, trazodone, and tricyclic anti-depressants), history of arthritis, and SF-12 PCS. We adjusted for SF-12 PCS because that variable fit the model best and was the strongest confounder among all the self-reported or objective physical function measures. The physical activity (PASE) score was unrelated to fall risk and therefore was not a confounding factor.

RESULTS SECTION:
Among 5,693 men in the analytic cohort, prevalence estimates of no back pain, mild, moderate and severe low back pain in the 12 months before enrollment were 33%, 28%, 32% and 6%, respectively. Radicular symptoms were reported by 40% of men with low back pain.

During 1 year of follow-up, 771 (14%) reported only 1 fall and 669 (12%) reported ≥2 falls. Men with back pain more frequently reported any fall during follow-up than men without. For no low back pain, the unadjusted 1-year fall risk was 20%, and for mild, moderate, and severe low back pain the risks were 25%, 28% and 38% respectively (Figure 1).

Figure 1. One-year incident fall risk according to low back pain severity among men ages ≥65 years: the MrOS study.

In multivariable analysis, risk of any fall was significantly elevated among men with low back pain (Figure 2). Compared to no low back pain, multivariable RRs were 1.3 (95% CI: 1.1-1.4) for mild back pain, 1.2 (95% CI: 1.1-1.4) for moderate back pain, and 1.4 (95% CI: 1.2-1.7) for severe back pain. Likewise, men with low back pain were more likely than men without to experience recurrent falls. The RRs for ≥2 falls were 1.2 (95% CI: 1.0-1.5) for mild, 1.4 (95% CI: 1.2-1.7) for moderate, and 1.6 (95% CI: 1.3-2.1) for severe low back pain.

Figure 2. Risk ratios for incident falls in relation to low back pain severity among elderly men: the MrOS study.

We also computed RRs for fall risk in relation to back pain occurring with and without radiculopathy. Compared to men without back pain, the risk of any fall was 1.2 (95% CI: 1.1-1.4) among men with low back pain alone and was 1.3 (95% CI: 1.1-1.4) times greater among men with both back pain and leg pain. RRs for ≤2 falls were 1.3 (95% CI: 1.1-1.5) among men with low back pain alone and 1.4 (95% CI: 1.2-1.7) among men with both back and leg pain, compared to men with no back pain.

CONCLUSION:
Elderly community-dwelling men with low back pain are at increased risk for falling. The association of low back pain with fall risk was not completely explained by differences in age, CNS medication use, or physical function between men with and without back pain. Thus, falling may be an adverse consequence of low back pain that has not been documented previously. These results may not apply to women or to younger adults. Clarifying mechanisms by which back pain increases fall risk could be important for clinical and public health interventions.