Kaila-Kangas L, Leino-Arjas P, et al. History of Physical Work Exposures and Clinically Diagnosed Sciatica Among Working and Nonworking Finns Aged 30 to 64. Spine 2009;34(9):964-969.

Design: Cross sectional study with retrospective exposure assessment

Population/sample size/setting:

- 5871 Finns between ages 30 and 64 invited to be interviewed in a health survey of the overall health of the Finnish population between 2000 and 2001

- Of the 5871 potential subjects, 88% were interviewed and 83% attended a health examination by physicians specially trained for the project
- Working-age subjects were stratified into two groups: currently working (n=3801) and not currently working (n=1010)

Exposure determination:

- Work-related physical loading was assessed during home visits from Statistics Finland at which interviewers asked about general health, provided information about the heath examination by the physicians, and made clinic appointments for the examinations
- Respondents were asked about exposure to work-related factors in their current job and in their 5 longest lasting previous jobs
- A cumulative exposure index was estimated for several workload factors, and were divided into 4 categories of duration: none, 1 to 10 years, 11 to 20 years, and more than 20 years
    - General physical strenuousness was evaluated in terms of tasks such as lifting or carrying heavy objects, excavating, digging, and pushing
        - Handling heavy objects meant lifting or manually carrying/pushing objects greater than 20 kg at least 10 times per work day
        - Handling lighter objects meant lifting or carrying greater than 5 kg for at least 2 hours per work day
    - Bending meant holding the body in a bent posture with nothing to hold on to for an average of at least 1 hour per work day
    - Kneeling meant working on bended knees for an average of at least 1 hour per work day
    - Standing meant standing or walking for an average of at least 5 hours per work day
    - Sitting meant prolonged sitting, exclusive of driving, for at least 5 hours per work day
- Additional exposures were in height/weight, level of formal education, smoking history, and leisure time exercise

Outcome assessment:

- Sciatica was determined by presence of nerve root entrapment with straight leg raising producing typical radiating pain with less than 60° leg raising, clinical signs of radiculopathy (for example, hallux extensor weakness for the L5 root, diminished Achilles tendon reflex for the S1 root)
- Sciatica was classified as definite or possible, both of which were included in the study
    - "Possible" meant that the subject did not currently have symptoms, or there was some vagueness in the criteria
    - 44% of subjects with sciatica were classified as possible
- A sample of subjects (n=173) were selected for assessment if interexaminer reliability with the sciatica diagnosis, each examined by 2 physicians from 2 separate field teams
    - Cohen's kappa was .057 [conventionally considered moderate agreement—EW]
    - The prevalence of sciatics was 5.8% and 4.1% in the first and repeat examinations
- Sciatica was also considered present if there had been a history of lumbar disc herniation confirmed by imaging or requiring surgery

Main results:

- A logistic regression model was fitted with sciatica as a binary outcome variable adjusted for age, BMI, and smoking
- Among men, there were 122 cases of sciatica, and cumulative heavy work load in general was associated with sciatica with an odds ratio (OR) of 1.85 for 1-10 years of exposure, an OR of 2.67 for 11-20 years, and an OR of 1.63 for more than 20 years
    - For other categories (handling light objects, handling heavy objects, kneeling, bending) the pattern was similar: an elevated OR for 1-10 years of exposure, a higher OR for 11-20 years, and an OR for more than 20 years which was lower than for 11-20 years but elevated with reference to no exposure
    - Among currently working men, with 80 cases, the OR for 11-20 years of exposure was 2.37, but for more than 20 years of heavy work exposure the OR was only 0.98
    - For the nonworking men, the OR was significantly elevated for all levels of heavy work exposure: the OR was 5.44 for 1-10 years, 4.28 for 11-20 years, and 4.11 for more than 20 years
- Among women, there were 106 cases of sciatica
    - There was no apparent dose-response relationship between heavy physical work and sciatica in working women (69 cases), but among non-working women (with 37 cases of sciatica) elevated odds ratios were seen in a dose-response relationship, but the confidence intervals were very wide and not statistically significant
- Many work exposures (kneeling, handling, bending) were highly correlated and were not entered separately in the same logistic regression model to avoid problems arising from multicollinearity

Authors' conclusions:

- For both men and women, sciatica was more prevalent in nonworking subjects than in those currently working
- Physically heavy work was associated with sciatica, and the relationship was greater for nonworking than for currently working men and women
- Long sedentary work was not associated with sciatica
- The greater prevalence of sciatica, and the greater association between physical work load and sciatica, are suggestive of health-related selection out of the workforce (healthy worker survivor effect), and may lead to an underestimation of the relationship between physically demanding work and sciatica
- It may be that work load is not a primary cause of sciatica, but a trigger of sciatic pain in constitutionally vulnerable subjects

Comments:

- The assessment of exposure is less than optimal, being based on self-report, but was acceptable, since it was based on structured interviews of quantitative estimates and not on unacceptable measures such as job title or industry classification
- The assessment of outcome was acceptable, being done by trained physicians with at least moderate interrater reliability
- For a cross-sectional study, it is likely that the time frame was longer than any plausible induction period for sciatica; both current and cumulative exposures were measured
- The population was part of a general health survey of past and present workers in Finland, and a reasonably high participation rate indicates that the study sample is representative of the population form which it was selected
- The strengths of the study outweigh the potential weaknesses from retrospective exposure assessment, making the study adequate for purposes of evidence

Assessment: Adequate for evidence that high physical workloads are associated with sciatica in working populations, either as primary causes or as triggers of the development of nerve root symptoms