

Haahr JP, Andersen JH. Physical and psychosocial factors for lateral epicondylitis [LE]: a population based case-referent study. *Occup Environ Med* 2003;60:322-329.

Design: Case-control study

Population/sample size/setting:

- 209 cases of LE (109 women, 100 men) and 274 controls (156 women, 118 men) without LE drawn from 146 general practices in Denmark
- Case definition of LE was pain at the lateral humeral epicondyle, with tenderness on resisted extension and with palpation on physical examination
- All cases were newly diagnosed; patients with elbow pain more than one year, previous elbow operation, or known rheumatic disorder were excluded
- Controls were matched to cases by gender and age (18-35, 36-45, and 46-66), randomly selected from the registry of the public health insurance office
- 360 cases were invited to participate, 289 gave consent, and 267 cases completed a questionnaire (response rate=92%)
- 546 controls were sent an identical questionnaire, and 388 controls returned a questionnaire (response rate=71%)
- Final analysis had 209 cases and 274 controls who were presently employed, not self-employed, had no rheumatic disorder, and were no missing data on key variables

Exposure/outcome relationships:

- Questionnaire data included age, gender, height, weight, education, health status, and possible risk factors
- Physical exposure at work was assessed by position held and duration of present or latest employment; ergonomic measurements in the workplace were not done
- Positions held were classed as physically strenuous (e.g., carpenter, farmer, cleaner, metalworker) or not strenuous (e.g., nurse, teacher, typist, office assistant)
- Physical work load factors were assessed by questions about the weight of tools used and how much of the workday was spent using the tools
- Posture, repetitive movements, static load, and vibration exposures were similarly assessed by questions concerning work activities
- Psychosocial workplace factors were assessed by 21 questions; 3 about job demands, 14 about job control, and 4 about social support
- Job satisfaction was assessed by 8 questions of the type, "How satisfied are you with...?"
- Odds ratios (approximate measures of relative risks) were elevated for most of the physical job characteristics, suggesting that they increased the risk of LE
- Odds ratio for high force/high repetition was 3.9 in a model that adjusted for age, gender, and body mass index; the odds ratio was 2.5 when adjusted for social support, job demands, and job control in addition to age, gender and BMI

- Odds ratio for high repetition and extreme posture was 3.0 in a model that adjusted for age, gender, and BMI; the odds ratio was 2.1 when additionally adjusted for social support, job demands, and job control
- Low social support increased the risk for women (OR=3.0) but not for men (OR=1.0)
- High job demands were not associated with LE
- Sports activities were not associated with LE
- High repetition alone was not associated with LE
- Extreme posture alone was not associated with LE

Authors' conclusions:

- LE is related to physical workforce factors in men and women
- LE is related to low social support in women
- Force, posture, and repetitive movements are probably independent risk factors for LE
- Psychosocial workplace factors do not appear to be major risk factors for LE, but there may be an interaction between physical strain and low social support for women
- Selection bias seem unlikely, given that controls had similar numbers of physician visits as cases
- Recall bias seems unlikely, given that both cases and controls reported similar prevalence of pain in regions other than the upper extremities, and also that the cases of LE were all newly diagnosed
- Workplace modification should include modification of physical factors and, at least for women, a more accommodating environment

Comments:

- Classification of exposure by self-report (e.g., the weight of tools) lacks precision, but the direction of the bias created by this misclassification is not easy to predict
- If the misclassification is random (is equally likely in both cases and controls), the bias will diminish the magnitude of the effect of the exposure and to underestimate the true odds ratio
- If the misclassification is nonrandom (if tools feel heavier to workers experiencing LE), then the bias will inflate the effect of the exposure
- However, the discussion section is well thought out, and most sources of bias are defended against

Assessment: Adequate for a statement that high force and high repetition and extreme postures jointly increase the risk of LE