**Walker-Bone K, Palmer KT, et al. Occupation and epicondylitis: a population-based study. Rheumatology (Oxford). 2012 Feb;51(2):305-10.**

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Design: cross-sectional population-based study

Purpose of study: to estimate the prevalence of lateral and medial epicondylitis in working-aged adults, and to explore possible relationships between occupation and epicondylitis

Population/sample size/setting:

* All men and women (n=9696) aged 25-64 registered in one of two general practices in Southampton, England
* Eligibility criteria were few: potential subjects had to be living at the most recent address listed in the practice’s records, and the GP had to be of the opinion that the patients in the practice were not suffering from illness or recent bereavement which would make it inadvisable to approach them or would make it impossible for them to answer a self-administered questionnaire

Ascertainment of outcome/condition:

* Each member of the study population was sent a questionnaire asking about demographic variables, lifestyle, employment, and symptoms of elbow pain lasting at least one day in the past 7 days; non-responders were sent a reminder by mail after 4 weeks
* All respondents reporting elbow pain in the past week were invited to attend an interview and examination
* Trained research nurses used a structured questionnaire to collect additional information about the distribution of symptoms at the elbow, and conducted an examination looking for tenderness and pain on resisted extension of the wrist (for lateral epicondylitis) or on resisted flexion of the wrist (for medial epicondylitis)
* An algorithm was applied to the findings from the interview and examination to classify subjects as having lateral epicondylitis, medial epicondylitis, or nonspecific elbow pain
* Prevalence of epicondylitis and nonspecific elbow pain were calculated based on an assumption that the respondents were representative of the study population and that those who underwent nurse interview and examination were representative of all those who were invited to attend

Assessment of exposure:

* The study questionnaire focused principally on mechanical workplace factors: (use of a keyboard >1 and/or >4 h/day; repetitive movements of the wrist or fingers >1h and/or >4 h/day; bending/straightening elbow >1 h/day; use of hand/arm vibrating tools >1 h/day; working with arms above shoulder height >1 h/day; carrying weights on one shoulder; lifting weights >5 kg in one hand; working with neck bent forwards >2 h/day; and working with neck twisted)
* In addition, the questionnaire asked about psychosocial workplace factors (bonuses, targets; piecemeal work and deadlines; available support from colleagues and seniors; latitude at work and job satisfaction)

Response rates and prevalence estimates:

* Out of 9696 working-aged adults in the study population, 6038 (62%) returned the questionnaire with useable replies
* 3152 of these 6038 respondents reported symptoms in the neck, shoulder, elbow, or wrist/hand
* Elbow pain was reported in 636 of these 3152 respondents; the others reported pain in the neck, shoulder, or wrist/hand
* All 636 respondents with elbow pain were invited for examination, and 412 (65%) attended
* Of these 412 who attended the examination, 240 had elbow pain at interview
	+ 45 had lateral epicondylitis
	+ 34 had medial epicondylitis
	+ 170 had nonspecific elbow pain
	+ The estimated point prevalence for lateral epicondylitis was 0.8% among men and 0.7% among women
	+ The estimated point prevalence for medial epicondylitis was 0.4% among men and 0.7% among women
	+ The highest prevalence of epicondylitis was in the age group 45-54, where the point prevalence of lateral epicondylitis was 1.0% among men and 1.6% among women; for medial epicondylitis the estimates were 0.4% for men and 1.3% for women
* For medial and lateral epicondylitis, approximately 25% of participants reported that some daily activities (such as dressing, carrying, driving, or sleeping) were impossible; for nonspecific elbow pain, only 8% reported comparable difficulties

Occupational exposure/epicondylitis associations:

* Odds ratios (OR) were adjusted for age and gender for all occupational risk factors
* For lateral epicondylitis, psychological distress had an OR of 4.5 (95% confidence interval, 2.1 to 9.5), and being a blue-collar (manual) worker had an OR of 3.8 (95% CI 1.8 to 7.9)
	+ BMI, smoking, and diabetes were not associated with lateral epicondylitis
	+ Additional occupational risk factors were adjusted for psychological distress, blue-collar job status, age, and gender
	+ The adjusted OR for lateral epicondylitis and bending/straightening the elbow >1 hour per day was 2.5 (95% CI, 1.2 to 5.5)
	+ Other exposures, including keyboard use, working with arms above shoulder height, and hand-transmitted vibration, did not have elevated OR for lateral epicondylitis
* For medial epicondylitis, the OR for psychological distress was 4.9 (95% CI from 2.0 to 12.4), but blue-collar manual work did not have an elevated OR
	+ After adjustment for age, gender, and psychological distress, the only workplace factor which with an elevated OR was elbow bending/straightening > 1 hour per day (OR 5.1, 95% CI 1.8 to 14.3)

Authors’ conclusions:

* There is an important relationship between occupation and epicondylitis
* After adjustment for age, gender, and psychological distress, lateral and medial epicondylitis were associated with elbow straightening and bending more than one hour per day
* An association between physical workplace factors and epicondylitis has also been reported in butchers, autoworkers, and construction workers
* There is a potential for biased ascertainment of exposure in a self-reported questionnaire, which may result in overestimates of exposure, especially when workers believe themselves to have been harmed by workplace factors; however, the questionnaire asked about exposure to several anatomical regions, making it unlikely that such a selection bias would have applied
* The demographic characteristics of the respondents and non-respondents were similar, and the response rates on the order of just over 60% are comparable to other UK population studies
* Approximately 1% of adults in the UK are affected by epicondylitis at any given point in time
* The association with psychological distress does not necessarily imply cause and effect, since sufferers of epicondylitis are likely to be more anxious and distressed than non-sufferers

Comments:

* The ascertainment of exposure by self-report is common in epidemiological studies of musculoskeletal disorders in the workplace, but is more reliable than such variables as job title
* It appears that the completion of the questionnaire data and the physical examinations were carried out by the research nurses, whose examinations may have been done with awareness of self-reported exposures
* The point prevalence of epicondylitis was applied to the study population under the assumption that the 6038 respondents were representative of the study population of 9696 general practice patients; it is likely that this is at least a slight overestimate, since people with current elbow symptoms are probably more likely than entirely asymptomatic people to return the survey questionnaires
* The fairly wide confidence intervals for the odds ratios were probably attributable to the limited numbers of cases (45 for lateral epicondylitis and 34 for medial epicondylitis)
	+ The adjusted OR for lateral epicondylitis had five variables: elbow bending/straightening, age, gender, psychological distress, and blue collar job type); this means that there were 9 cases per variable in the adjusted model
	+ Regression coefficients are generally more stable when there are 10 or more cases per variable in the model; the slight “overloading” of the regression model is not expected to lead to biased odds ratios, but the precision of the estimates is likely to suffer
	+ Adjusting for blue-collar status in the estimate of bending/strengthening of the elbow might be expected to weaken the odds ratio, but in Table 2, it appears that the crude and adjusted odds ratios both have point estimates of 2.5; it is not clear why a likely confounder did not affect the odds ratio
		- That is, blue-collar status is likely to be associated with the exposure (elbow activity), with the outcome (epicondylitis), and is not “caused” by elbow activity, making it a candidate for a confounder
* In spite of some significant weaknesses, the study is based on a large population with a wide range of ages and occupations, and is adequate for the demonstration of frequent elbow activity and epicondylitis, both medial and lateral

Assessment: adequate for some evidence that both medial and lateral epicondylitis are associated with workplace factors involving bending and straightening of the elbow for at least one hour per day. However since bending and straightening the elbow one hour total per day is similar to everyday activity it does not constitute an evidence statement for occupational risk.