

Chiang H-C, Chen S-S, et al. The Occurrence of Carpal Tunnel Syndrome in Frozen Food Factory Employees. Kaohsiung J Med Sci 1990;6:73-80.

Design: Cohort study

Population/sample size/setting:

- 207 workers (80 men, 127 women, mean age 40) at a frozen food factory in Taiwan, selected from a total of 219 potential subjects
- Excluded from study if they had diabetes, thyroid disorder, forearm fracture, polyneuropathy, or rheumatoid arthritis

Main outcome measures

- Job analyses into 3 categories were made by industrial hygienist whose classification was concealed from the authors making the diagnoses
- Group I (n=49) was office staff who did not handle food and served as a control group
- Group II (n=37) treated and packed the food prior to frozen storage
- Group III (n=121) packed frozen foods with temperatures between -12° C and -15° C; all wore gloves during food handling
- CTS diagnosed by structured interview, standardized neurological exam, and nerve conduction studies, with onset of symptoms since working on current job
- CTS was present in only 2 workers in group I, but was present in 17 workers in group II and in 57 workers in group III
- Multiple logistic regression was used to estimate odds ratios (OR) adjusted for age, sex, and length of employment; the exposures of interest were exposure to cold (yes/no) and repetitive wrist movement (yes/no)
- Compared to group I, odds ratios for CTS, adjusted for sex, age, and length of employment were elevated for groups II and III combined (OR=7.4) and for group III (OR=9.39)
- Compared to group I, the same OR for group II, adjusted for sex, age, and length of service, was 2.18, but the confidence interval included the null value of 1.0
- In the multiple logistic model, cold, repetitiveness, and the interaction of cold and repetitiveness, were all significantly associated with CTS

Authors' conclusions:

- Both repetitive wrist movements and cold temperature are associated with CTS
- The interaction of cold and repetition is also significantly associated with CTS
- The interpretation of the effect of cold should be made with caution, since workers who handle frozen meat use more force than non-frozen food workers
- The proportion of CTS in frozen food workers was high, but not greater than that among other studies of CTS in the workplace

Comments:

- Repetitiveness was classified by industrial hygienists whose evaluations were concealed from the examiners, but the definition of repetition in cycles per minute or per hour is not defined
- The ambient temperature of the room in which the non-frozen food workers did their tasks was not defined, but may have been below room temperature for the office workers
- The OR for group II compared to group I was 8.28 when adjusted for age and sex; when length of employment was also in the adjustment, the OR was 2.18; this large change in the OR signifies confounding by length of employment which is not explained
- There is an error in Table 4, where the coefficient for Cold has a chi-square of 5.32 and a p value of 0.2211; the p value for chi-square of 5.32 with 1 degree of freedom is 0.021, which is the likely intended p value
- In spite of these shortcomings, the effect of the joint effect of cold and repetition is not likely to be eliminated if the methods were more precise, given the large odds ratios compared to the unexposed group

Assessment: Adequate for an evidence statement that cold temperature and repetition jointly increase the likelihood of CTS