Personal and workplace psychosocial risk factors for carpal tunnel syndrome: a pooled study cohort: author response

The analysis we presented in the August 2013 issue of *Occupational and Environmental Medicine*[1] was performed by pooling raw data from 3515 workers from more than 50 workplaces collected by six research teams. This was not a meta-analysis but rather an analysis of data at the level of the individual participants. Meta-analyses are typically performed because the raw data are not available. Pooling of data at an individual subject level results in a more heterogeneous population with greater generalisability, increased variation in exposure and more statistical power than either a meta-analysis or an analysis restricted to any particular research group.

However, the recommendation to perform a multilevel analysis that includes site as a random-effect is not unreasonable.[2] Although we have no reason to believe that self-reported variables, such as non-occupational hand intensive activity, were differentially reported across research sites, there may be unmeasured covariates unique to each site that confound associations between exposure and carpal tunnel syndrome (CTS) when data are pooled. Therefore, we repeated the analysis with a multilevel approach using a Cox frailty model with clustering by research site. This model examines whether any of the variation in CTS that is unexplained by the individual level exposures and covariates is explained by study site. Results of the multilevel model with site included were unchanged; those engaged in hand intensive activities for three or more hours per week had a reduced risk of developing CTS (new analysis: HR=0.67; 95% CI 0.46 to 0.97; from prior publication: HR=0.58; 95% CI 0.41 to 0.82).

The literature on the association between non-occupational hand activity (eg, hobbies, sports) and risk of CTS is very limited.[3] Typically, the hours per week of exposure to non-occupational forceful hand activities are much less than exposure time at work.

There are several possible explanations for observing a protective association between non-occupational hand intensive activity at baseline and the subsequent development of CTS. Approximately 11% of individuals who were symptomatic at baseline eventually developed CTS. It is plausible that as a worker develops CTS symptoms, he or she would engage in less hand intensive activities outside of work. It is also possible that greater than 3 hours per week exposure to non-occupational hand activities helps to condition a person for hand intensive work tasks and provides some protection against CTS.

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REFERENCES

1 Harris-Adamson C, Eisen EA, Dale AM, *et al*. Personal and workplace psychosocial risk factors for carpal tunnel syndrome: a pooled study cohort. *Occup Environ Med* 2013;70:529–37.
2 Shiri R. Personal and workplace rish factors for cappal tunnel syndrome. *Occup Environ Med* 2014;71:303.
3 Birkbeck MQ, Beer TC. Occupation in relation to the carpal tunnel syndrome. *Rheumatol Rehabil* 1975;14:218–21.

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