Editorial

Scand J Work Environ Health 2004;30(4):257-259

doi:10.5271/sjweh.793

Men-the weaker sex? Unexpected results of a systematic review on work exposures and musculoskeletal disorders.

by Leino-Arjas P

Affiliation: Department of Epidemiology and Biostatistics, Finnish Insitute of Occupational Health, Topeliuksenkatu 41 A a, FI-00250 Helsinki, Finland. päivi.leino-arjas@ttl.fi

Refers to the following texts of the Journal: 2004;30(4):261-278 2000;26(2):161-168

The following article refers to this text: 2009;35(2):85-95

Key terms: editorial; exposure; gender; man; MSD; musculoskeletal disorder; review; sex; work; work exposure

This article in PubMed: www.ncbi.nlm.nih.gov/pubmed/15458008

Editorial

Scand J Work Environ Health 2004;30(4):257–259

Men—the weaker sex?

Unexpected results of a systematic review on work exposures and musculoskeletal disorders

Women report more work-related musculoskeletal problems than men, particularly regarding afflictions of the neck and upper limbs (1–3). The factors to which this inequality should be attributed are far from obvious, however. Men and women are sometimes described as if they inhabit different worlds—biologically, mentally, and socially.

In this issue of the *Scandinavian Journal of Work, Environment & Health*, Hooftman et al attempt to contribute to our understanding of this, so far, relatively neglected theme with their systematic literature review (4). Their interest is, specifically, in whether men and women respond differently to work-related exposures in terms of derangements of musculoskeletal health. The scope of the paper is comprehensive. The objective is to compare the genders with respect to the risk estimates of the principal physical and psychosocial work exposures in relation to all major musculoskeletal outcomes—disorders of the neck and low back, as well as disorders of the upper and lower limbs.

An extensive literature search in electronic and personal databases yielded 1500 hits. Using predetermined inclusion criteria, the authors finally reduced the articles to be considered to 31. Thus only a handful of studies on each outcome group was available. A third of the studies passed their assessment as presenting high-quality evidence.

With this material on hand, the authors came to conclusions that surprised themselves and probably also many a reader. They found strong evidence for men having a higher risk of back complaints due to lifting than women, for men having a higher risk of neck–shoulder complaints due to hand–arm vibration, and for women having a higher risk of these complaints due to awkward arm postures. No evidence was found for a gender effect in responses to a lack of social support in relation to back or neck–shoulder disorders. In all other cases, the evidence was considered inconclusive.

As such, the results seem unexpected, difficult to account for, even provocative. The authors wisely urge us to consider their results with caution. A process of reducing information, however logical and well-arranged, that leads to a fraction (in this case 2%) of the original literature for evaluation in detail necessarily involves an element of chance. Publication bias probably also plays a role. In addition, to be balanced with a gender ratio of 0.75 (women having a lower risk than men), a ratio of 1.33 (not 1.25) should be considered to indicate an increased risk for women.

What does this examination of existing evidence teach us? Obviously, that more well-designed studies are needed. Second, as evidence does not provide an explanation for gender differences in musculoskeletal morbidity, other explanations should also be sought.

The hypothesis inherent in the study of Hooftman et al is that of a differential vulnerability of women and men to work exposures. Within the vulnerability model, women's higher pain sensitivity could be considered. Pain is the leading symptom in musculoskeletal disorders. A meta-analysis of laboratory experiments indicates that women exhibit greater sensitivity to various noxious stimuli (5). In particular, responses to mechanically induced pressure and the temporal summation of mechanically evoked pain are more marked among women (6).

However, the differences in pain sensitivity between genders are not large, and their mechanisms remain unclear. Paulson et al (7) reported that women perceive a similar heat stimulus as more painful than men and this perception is accompanied with somewhat dissimilar nociceptive processing in the brain, as revealed by positron emission tomography. Pressure–pain thresholds—which might be more important in the genesis of musculoskeletal pain—have been found to increase with muscle strength (8), which, of course, is generally higher in men than in women. It remains an open question whether or not muscle strength is a significant factor in the etiology of musculoskeletal disorders, and if so, why.

There are naturally several other candidates in the physiological sphere as factors contributing to gender differences in morbidity, including the possible roles of sex hormones (9, 10).

An attractive alternative to the vulnerability model is the hypothesis of unequal exposure. While most women in developed economies are nowadays in paid employment, the distribution of jobs to which women are recruited differs from that of men. How is the gender segregation of worklife reflected in musculoskeletal morbidity? The answer to this complex question would have both practical and a good deal of theoretical relevance.

The division of labor by gender leads to different combinations of various work exposures, physical and psychosocial, among men and women. The demands of work may be higher among women, and the ability to influence work methods and content may be lower. Women and men may use different work techniques. There may be differences in the work organization and climate of female- and male-dominated workplaces. Career development and workload changes may not be the same for men and women (11). Finally, gender roles impose a higher load from domestic work on women.

Recently, Strazdins & Bammer (12) examined the causes of women's excess reporting of upper-limb disorders in two Australian governmental organizations. Most of the survey sample was employed in clerical work. The increased symptom severity among women was explained by a higher occurrence of repetitive work among them, poorer ergonomic equipment, and less opportunity to relax and exercise outside work. The work–home interface was important, and parenthood increased the gender difference. Cross-product terms for gender and each predictor variable were analyzed, but only time to relax and exercise was more strongly associated with women's symptoms than men's. No evidence for differential vulnerability was otherwise found.

The qualitative literature review by Punnett & Herbert (3) provides largely the same conclusions. They found that using objective clinical measures for case definition did not abolish gender differences, but, rather, accentuated them; in other words, dissimilar pain reporting cannot be the sole explanation. For a study to be included in the analysis, it was required that ergonomic exposures be reported in a way that made adjustment for them possible. Once this was done, no consistent gender pattern in musculoskeletal morbidity was found in the available literature.

The occurrence and magnitude of gender differences in disorders of the musculoskeletal system among the working population deserve a rigorous systematic review of their own. Such basic information would be of use in searches for the causes of the inequalities. Systematic reviews focusing on the differential exposure model would also be welcome.

References

1. Unruh AM: Gender variations in clinical pain experience. Pain 1996;65:123–67.
2. Kilbom Å, Messing K. Aches and pains—an affliction of women: work-related musculoskeletal disorders. In: Kilbom Å, Messing K, Bildt Thorbjörnsson C, editors. Women's health at work. Solna (Sweden): National Institute of Working Life; 1998. p 203–27.
3. Punnett L, Herbert R. Work-related musculoskeletal disorders: is there a gender differential, and if so, what does it mean? In: Goldman MB, Hatch MC, editors. Women and health. San Diego (CA): Academic Press; 2000. p 474–92.
4. Hooftman WE, van Poppel MNM, van der Beek AJ, Bongers PM, van Mechelen W. Gender differences in the relations between work-related physical and psychosocial risk factors and musculoskeletal complaints [review]. Scand J Work Environ Health 2004;30(4):261–78.
5. Riley JL 3rd, Robinson ME, Wise EA, Myers CD, Fillingim RB. Sex differences in the perception of noxious experimental stimuli: a meta-analysis. Pain 1998;74:181–7.
6. Sarlani E, Greenspan JD. Gender differences in temporal summation of mechanically evoked pain. Pain 2002;97:163–9.

7. Paulson PE, Minoshima S, Morrow TJ, Casey KL. Gender differences in pain perception and patterns of cerebral activation during noxious heat stimulation in humans. Pain 1998;76:223–9.
8. Torgén M, Swerup C. Individual factors and physical work load in relation to sensory thresholds in a middle-aged general population sample. Eur J Appl Physiol 2002;86:418–27.
9. Richette P, Corvol M, Bardin T. Estrogens, cartilage, and osteoarthritis. Joint Bone Spine 2003;70:257–62.
10. Eriksen W. Linking work factors to neck myalgia: the nitric oxide/oxygen ratio hypothesis. Med Hypotheses 2004;62:721–6.
11. Torgen M, Kilbom Å. Physical work load between 1970 and 1993—did it change? Scand J Work Environ Health 2000;26(2):161–8.
12. Strazdins L, Bammer G. Women, work and musculoskeletal health. Soc Sci Med 2004;58:997–1005.

Päivi Leino-Arjas, DMedSci
Department of Epidemiology and Biostatistics
Finnish Institute of Occupational Health
Topeliuksenkatu 41 A a
FI-00250 Helsinki, Finland
[Paivi.Leino-Arjas@ttl.fi]