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

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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.

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