Should studies of risk factors for musculoskeletal disorders be stratified by gender? Lessons from the 1998 Québec Health and Social Survey

¿Deberán los estudios de factores de riesgo osteomusculares estratificar por género? Lecciones a partir de la Investigación en Salud y Social de 1998

by Messing K, Tissot F, Stock SR

Objectives Several studies have reported male-female differences in the prevalence of symptoms of work-related musculoskeletal disorders (MSD), some arising from workplace exposure differences. The objective of this paper was to compare two strategies analyzing a single dataset for the relationships between risk factors and MSD in a population-based sample with a wide range of exposures.

Methods The 1998 Québec Health and Social Survey surveyed 11 735 respondents in paid work and reported “significant” musculoskeletal pain in 11 body regions during the previous 12 months and a range of personal, physical, and psychosocial risk factors. Five studies concerning risk factors for four musculoskeletal outcomes were carried out on these data. Each included analyses with multiple logistic regression (MLR) performed separately for women, men, and the total study population. The results from these gender-stratified and unstratified analyses were compared.

Results In the unstratified MLR models, gender was significantly associated with musculoskeletal pain in the neck and lower extremities, but not with low-back pain. The gender-stratified MLR models identified significant associations between each specific musculoskeletal outcome and a variety of personal characteristics and physical and psychosocial workplace exposures for each gender. Most of the associations, if present for one gender, were also found in the total population. But several risk factors present for only one gender could be detected only in a stratified analysis, whereas the unstratified analysis added little information.
Conclusions  Stratifying analyses by gender is necessary if a full range of associations between exposures and MSD is to be detected and understood. Refers to the following texts of the Journal: 2005;31(2):138-151  2007;33(5):344-350

Key terms 1998 Québec Health and Social Survey; back pain; epidemiology; gender; gender-based analysis; lower limb pain; musculoskeletal disorder; neck pain; occupational health; risk factor; woman


Interaction between postural risk factors and job strain on self-reported musculoskeletal symptoms among users of video display units: a three-year prospective study

Interacción entre factores de riesgo postural y esfuerzo en el trabajo en síntomas osteomusculares con cuestionario autoadministrado en trabajadores de PVD: un estudio prospectivo de tres años

by Lapointe J, Dionne CE, Brisson C, Montreuil S

Objective  This study investigated a possible interaction between postural risk factors and job strain on the incidence proportion of self-reported musculoskeletal symptoms in the shoulder-neck, lower back and upper limbs regions.

Methods  A cohort of white-collar workers (N=2431) was assessed with a self-administered questionnaire regarding postural risk factors and job strain at work. After a three-year follow-up, the six-month incidence proportion of musculoskeletal symptoms in the three body regions was measured with a modified version of the Nordic questionnaire. The analyses were stratified for gender. Interaction was defined as a departure from the addition of effects of individual risk factors, and its importance was estimated from the attributable proportion due to interaction and its 95% confidence interval (95% CI).

Results  A significant attributable proportion of 0.80 (95% CI 0.23-1.37) due to interaction between postural risk factors and job strain was observed for men in the lower back region. An indication of interaction was found for women with attributable proportions due to interaction of 0.44 (95% CI -0.06-0.94), 0.27 (95% CI -0.34-0.88) and 0.36 (95% CI -0.33-1.05) for the shoulder-neck, lower back, and upper limbs regions, respectively.

Conclusions  The simultaneous presence of postural risk factors and job strain seems to increase the pathogenic effect of each exposure on the incidence proportion of musculoskeletal symptoms. This interaction effect is important for work intervention practices as success in decreasing any of these two risk factors could have the additional benefit of reducing up to 80% of new cases of musculoskeletal symptoms among participants exposed to both risk factors. Refers to the following texts of the Journal: 2004;30(5):390-398  2003;29(3):197-205  2005;31(5):375-386  2001;27(1):49-56  2005;31(6):409-437  2007;33(1):58-65  2000;26(1):7-19

Meta-analysis of the effects of health promotion intervention in the workplace on depression and anxiety symptoms

Meta-análisis de efectos de intervención en promoción de la salud en el lugar de trabajo sobre síntomas de ansiedad y depresión

by Martin A, Sanderson K, Cocker F

Objectives The aim of the study was to investigate whether different types of health promotion intervention in the workplace reduce depression and anxiety symptoms.

Methods A systematic review and meta-analysis of the literature was undertaken on workplace health promotion published during the period 1997-2007. Studies were considered eligible for inclusion if they evaluated the impact of an intervention using a valid indicator or specific measure of depression or anxiety symptoms. The standardized mean difference was calculated for each of the following three types of outcome measures: depression, anxiety, and composite mental health.

Results Altogether 22 studies were found that met the inclusion criteria, with a total sample size of 3409 employees postintervention, and 17 of these studies were included in the meta-analysis, representing 20 intervention-control comparisons. The pooled results indicated small, but positive overall effects of the interventions with respect to symptoms of depression [SMD 0.28, 95% confidence interval (95% CI) 0.12-0.44] and anxiety (SMD 0.29, 95% CI 0.06-0.51), but no effect on composite mental health measures (SMD 0.05, 95% CI -0.03-0.13). The interventions that included a direct focus on mental health had a comparable effect on depression and anxiety symptoms, as did the interventions with an indirect focus on risk factors.

Conclusions When the aim is to reduce symptoms of depression and anxiety in employee populations, a broad range of health promotion interventions appear to be effective, although the effect is small.


Key terms anxiety symptom; depression risk; depression symptom; employee; health promotion; intervention; mental health; meta-analysis; systematic review; workplace


Associations between work-related factors and the carpal tunnel syndrome—a systematic review
Asociación entre factores relacionados con el trabajo y el síndrome del túnel carpiano

by van Rijn RM, Huisstede BMA, Koes BW, Burdorf A

Objectives The aim of this study was to make a quantitative assessment of the exposure-response relationships between work-related physical and psychosocial factors and the occurrence of carpal tunnel syndrome (CTS) in occupational populations.

Methods A systematic review of the literature was conducted on the associations of type of work, physical load factors, and psychosocial aspects at work to the occurrence of CTS. The associations between work factors and CTS were expressed in units. Results Jobs with the highest risk of CTS included work in the meat- and fish-processing industry, forestry work with chain saws, and electronic assembly work (OR 76.5, 21.3, and 11.4, respectively). The occurrence of CTS was associated with high levels of hand-arm vibration, prolonged work with a flexed or extended wrist, high requirements for hand force, high repetitiveness, and their combination. No association was found between any psychosocial risk factor and CTS. Contradictory findings were reported for associations between computer work and CTS.

Conclusions This review provides consistent indications that CTS is associated with an average hand force requirement of >4 kg, repetitiveness at work (cycle time 50% of cycle time performing the same movements), and a daily 8-hour energy-equivalent frequency-weighted acceleration of 3.9 m/s2.


Key terms carpal tunnel syndrome; force; hand-arm vibration; musculoskeletal disorder; nerve compression syndrome; repetitiveness; review; systematic review; work-related factorquantitative measures, namely, odds ratios (OR) or relative risks.

Scand J Work Environ Health 2009;35(1):56-64 :: Add to basket:

Musculoskeletal disorders among construction roofers—physical function and disability

Trastornos osteomusculares entre trabajadores de la construcción de tejados—función física y discapacidad

by Welch L, Haile E, Boden LI, Hunting KL

Objectives This study investigated the relationships between work demands, chronic medical and musculoskeletal conditions, aging, and the ability to remain on the job in a longitudinal study of 979 construction roofers between the ages of 40 and 59 years.

Methods In a phone interview at baseline and 1 year later, the participants were asked about the presence of medical conditions and musculoskeletal disorders, work limitations and work accommodations, and social and economic functioning.
**Results** Among the workers for whom a musculoskeletal disorder was their most serious condition at baseline, 8% left roofing due to a health condition during the first year of follow-up. A comparison between those who left and those who stayed identified older age and lower physical functioning as statistically significant predictors of leaving the trade. Workers with a musculoskeletal disorder and who, in the baseline interview, reported receiving some type of job accommodation for their musculoskeletal disorder had an odds ratio of 0.24 (P=0.07) for leaving work by the time of the 1-year follow-up when compared with workers with a musculoskeletal disorder and no job accommodation. The workers with three or more work limitations were also more likely to leave roofing, but this association disappeared after adjustment for other factors.

**Conclusions** Musculoskeletal conditions among roofers are strongly associated with work limitation, missed work, and reduced physical functioning, factors that are predictive of premature departure from the workforce. Job accommodation was provided for 31% of the roofers with a musculoskeletal disorder, and it was associated with a reduced likelihood of subsequently leaving roofing for health-related reasons.


Key terms job accommodation; longitudinal study; low-back pain; occupation; work ability; work limitation

**ARTÍCULOS: AMERICAN JOURNAL OF INDUSTRIAL MEDICINE**

*Am. J. Ind. Med. 52:17-24, 2009*

Inhalation incidents and respiratory health: results from the European Community respiratory health survey

Incidentes inhalatorios y salud respiratoria: resultados de la investigación en salud respiratoria de la Comunidad Europea

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**Keywords:** accident • asthma • epidemiology • inhalation • respiratory health

Abstract

Background

Inhalation incidents are an important cause of acute respiratory symptoms, but little is known about how these incidents affect chronic respiratory health.

**Methods:** We assessed reported inhalation incidents among 3,763 European Community Respiratory Health Survey (ECRHS) participants with and without cough, phlegm, asthma, wheezing or bronchial hyperresponsiveness. We then examined whether inhalation incidents during the 9-year ECRHS follow-up period were associated with a new onset of any of these respiratory outcomes among 2,809
participants who were free of all five outcomes at the time of the baseline ECRHS survey.

**Results:** Inhalation incidents were reported by 5% of participants, with higher percentages reported among individuals with asthma-related outcomes at the time of the baseline survey. Among participants without symptoms at baseline, our analyses generated non-statistically significant elevated estimates of the risk of cough, phlegm, asthma and wheezing and a non-statistically significant inverse estimate of the risk of bronchial hyperresponsiveness among participants who reported an inhalation incident compared to those without such an event reported.

**Discussion:** Our findings provide limited evidence of an association between inhalation incidents and asthma-related symptoms. These data could be affected by differences in the reporting of inhalation incidents according to symptom status at the time of the baseline survey; they should thus be interpreted with caution.

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**Am. J. Ind. Med. 52:89-98, 2009**

**Occupational exposure to blood and body fluids among health care workers in a general hospital, China**

Exposición laboral a sangre y fluidos corporales entre trabajadores de cuidados de salud en un hospital general de China

Min Zhang, BM, MMS, Huanqiang Wang, BM, MPH, Jianying Miao, BSc, Xieyi Du, BSc, MSc, Tao Li, BM, MMS, Zhenglai Wu, BM, MMS

**Objectives:** To understand current status of occupational exposure to blood and body fluids (BBF), and awareness of knowledge about occupational bloodborne pathogen exposures and universal precautions among hospital-based health care workers (HCWs).

**Methods:** A cross-sectional study was conducted during April to May 2004 to study incidence of occupational exposure to BBF among 1,144 hospital-based HCWs.

**Results:** The total incidence and the average number of episodes exposure to BBF was 66.3/100 HCWs per year and 7.5 per person per year in the past year, respectively. The incidence (per 100/HCWs per year) and the average number of episodes (per HCW per year) of percutaneous injury (PCI), mucous-membrane exposure (MME), and exposure to BBF by damaged skin was 50.3 and 1.8; 34.4 and 1.7; and 37.9 and 4.0, respectively. The leading incidence and the average number of episodes of PCI occurred in delivery room (82.6 and 1.8). The highest percentage of PCI's that occurred during the previous 2 weeks occurred during a surgical operation (22.8%). Of all sharp instruments, the suture needle contributed the highest percentage of PCI’s (24.7%) among HCWs in the last 2 weeks. Over two-thirds (68.3%) of respondents were immunized with Hepatitis B vaccine; less than one-half (47%) of HCWs wore gloves while doing procedures on patients. The respondents demonstrated a lack of knowledge regarding transmission of bloodborne diseases and universal precautions.

**Conclusions:** Risk for potential exposure to BBF appears high in HCWs, and almost all of episodes are not reported. It is urgent to establish the Guideline for Prevention and Control of Occupational Exposure to Bloodborne Pathogens among HCWs.
Dolor de extremidades superiores y uso de ordenadores entre estudiantes de ingeniería: un estudio de replicación

Cammie Chaumont Menéndez, PhD, MPH, MS, Benjamin C. Amick III, PhD, Mark Jenkins, MD, Cyrus Caroom, BA, Michelle Robertson, PhD, CPE, Ronald B. Harrist, PhD, Jeffrey N. Katz, MD, MS

Keywords: replication study • computer use • college students • graduate students • musculoskeletal

Abstract

Background

Recent literature identified upper extremity musculoskeletal symptoms at a prevalence of >40% in college populations. The study objectives were to determine weekly computer use and the prevalence of upper extremity musculoskeletal symptoms in a graduate student population, and make comparisons with previous graduate and undergraduate cohorts.

Methods: One hundred sixty-six graduate students completed a survey on computing and musculoskeletal health. Associations between individual factors and symptom status, functional limitations, academic impact, medication use, and health services utilization were determined. Logistic regression analyses evaluated the association between symptom status and computing. Cross-study comparisons were made.

Results: More symptomatic participants experienced functional limitations than asymptomatic participants (74% vs. 32%, P < 0.001) and reported medication use for computing pain (34% vs. 10%, P < 0.01). More participants who experienced symptoms within an hour of computing used health services compared to those who experienced symptoms after an hour of computer use (60% vs. 12%, P < 0.01). Years of computer use (OR = 1.59, 95% CI 1.05-2.40) and number of years in school where weekly computer use was more than 10 hr (OR = 1.56, 95% CI 1.04-2.35) were associated with pain within an hour of computing. Cross-study comparisons found college populations more similar than different.

Conclusion: The overall findings reinforced previous literature documenting the prevalence of upper extremity musculoskeletal symptoms in college populations, suggesting an important population for participating in public health interventions designed to support healthy computing practices and identify risk factors important to evaluate in future cohort studies.
Sensitization to wheat flour and enzymes and associated respiratory symptoms in British bakers

Joanne Harris-Roberts, PhD, Edward Robinson, BSc, Judith C. Waterhouse, HND, Catherine G. Billings, PhD, Alison R. Proctor, MSc, Micah Stocks-Greaves, Shamim Rahman, PhD, Gareth Evans, PhD, Andrew Garrod, MRSC, Andrew D. Curran, PhD, David Fishwick, MD

Keywords: respiratory symptoms • flour exposure • bakeries

Abstract

Rationale

Current literature suggests that flour exposed workers continue to be at risk of allergic sensitization to flour dust and respiratory ill health.

Objectives: A cross-sectional study of 225 workers currently potentially exposed to flour dust in British bakeries was performed to identify predictors of sensitization to wheat flour and enzymes.

Results: Work-related nasal irritation was the most commonly reported symptom (28.9%) followed by eye irritation (13.3%) and work-related cough or chest tightness (both 10.2%). Work-related chest tightness was significantly associated (OR 7.9, 1.3-46.0) with co-sensitization to wheat flour and any added enzyme. Working at a bakery with inadequate control measures was not a risk factor for reporting work-related respiratory symptoms (OR 1.3, 0.4-3.7). Fifty-one workers were atopic and 23 (14%) were sensitized to workplace allergens. Atopy was the strongest predictive factor (OR 18.4, 5.3-64.3) determining sensitization. Current versus never smoking (OR 4.7, 1.1-20.8) was a significant risk factor for sensitization to wheat flour or enzymes in atopic workers only, corrected for current level and duration of exposure. This effect was not seen in non-atopic workers (OR 1.9, 0.2-17.9). Evidence of sensitization to less commonly encountered allergens was also seen to Aspergillus niger derived cellulase, hemicellulase and xylanase mix, in addition to glucose oxidase and amyloglucosidase mix.
Conclusions: The combination of health surveillance and exposure control in this population has been insufficient to prevent clinically significant workplace sensitization. Smoking may pose an additional risk factor for sensitization in atopic workers.

ARTÍCULOS: JOURNAL OF OCCUPATIONAL MEDICINE AND TOXICOLOGY


Prevalence of latent tuberculosis infection among health care workers in a hospital for pulmonary diseases

Prevalencia de infección tuberculosa entre trabajadores de cuidados de salud en un hospital de enfermedades pulmonares

Anja Schablon, Gudrun Beckmann, Melanie Harling, Roland Diel and Albert Nienhaus

Abstract

Background: Little is known about the prevalence of latent tuberculosis infections (LTBI) in health care workers (HCW) in low-incidence countries especially in hospitals for pulmonary diseases. With Interferon-gamma release assays (IGRA), a new method for diagnosis of LTBI is available which is more specific than the tuberculin skin test (TST).

Objectives: The study was designed to estimate prevalence of LTBI among 270 HCW in a Hospital of Pulmonary Diseases routinely screened for TB.

Methods: LTBI was assessed by the QuantiFERON-Gold In Tube (QFT-IT). Information on gender, age, workplace, job title, BCG vaccination and history of both TB and TST were collected using a standardised questionnaire. Adjusted odds ratios for potential risk factors for LTBI were calculated.

Results: The prevalence of LTBI was 7.2%. In HCW younger than 30 years LTBI prevalence was 3.5% and in those older than 50 years 22%. Physicians and nurses showed a higher prevalence rate than other professions (10.8% to 4.5%). The putative risk factors for LTBI were age (>50 year OR 9.3, 95%CI 2.5–33.7), working as physicians/nurses (OR 3. 95%CI 1.2–10.4) and no previous TST in medical history (OR 4.4, 95%CI 1.01–18.9) when compared to those with a negative TST.

Conclusion: Prevalence of LTBI assessed by QFT-IT is low, this indicates a low infection risk even in hospitals for pulmonary diseases. No statement can be made
regarding the occupational risk as compared to the general population because there are no LTBI prevalence data from Germany available. The higher LTBI prevalence rate in older HCWs might be due to the cohort effect or the longer time at risk.

ARTÍCULOS: OCCUPATIONAL AND ENVIRONMENTAL MEDICINE

Occupational and Environmental Medicine 2009;66:105-110

A cross-sectional study of lung function and respiratory symptoms among chemical workers producing diacetyl for food flavourings

Estudio transversal de función pulmonar y síntomas respiratorios entre trabajadores de empresas químicas productoras de diacetil para aromatizantes alimentarios


Objectives: Four diacetyl workers were found to have bronchiolitis obliterans syndrome. Exposures, respiratory symptoms, lung function and exposure-response relationships were investigated.

Methods: 175 workers from a plant producing diacetyl between 1960 and 2003 were investigated. Exposure data were used to model diacetyl exposure. Lung function and questionnaire data on respiratory symptoms were compared to a general population sample and respiratory symptoms to an internal reference group.

Results: Workers were potentially exposed to acetoin, diacetyl, acetaldehyde and acetic acid. Historic diacetyl exposure ranged from 1.8 to 351 mg/m³, and from 3 to 396 mg/m³ for specific tasks. Diacetyl workers reported significantly more respiratory symptoms compared to the general population sample (continuous trouble with breathing (prevalence ratio (PR) = 2.6; 95% CI 1.3 to 5.1), daily cough (PR = 1.5; 95% CI 1.1 to 2.1), asthma attack (ever) (PR = 2.0; 95% CI 1.2 to 3.4), doctor diagnosed asthma (PR = 2.2; 95% CI 1.3 to 3.8) and asthma attack in the last year (PR = 4.7; 95% CI 1.9 to 11.4)) and to a minimally exposed internal reference group (ever trouble with breathing (PR = 2.8; 95% CI 1.1 to 7.0) and work-related shortness of breath in the last year (PR = 7.5; 95% CI 1.1 to 52.9)). Lung function did not differ between groups. A positive relationship between exposure and FEV₁ was found.
Conclusion: The excess of respiratory symptoms in this retrospective cohort suggests that diacetyl production poses an occupational hazard. Limited historical exposure data did not support a quantitative individual diacetyl exposure-response relationship, but our findings suggest that preventive measures are prudent.

**Occupational and Environmental Medicine 2009;66:99-104**

Urinary naphthalene and phenanthrene as biomarkers of occupational exposure to polycyclic aromatic hydrocarbons

Naftaleno y fenantreno en orina como biomarcadores de exposición laboral a hidrocarburos aromáticos policíclicos


Objectives: The study investigated the utility of unmetabolised naphthalene (Nap) and phenanthrene (Phe) in urine as surrogates for exposures to mixtures of polycyclic aromatic hydrocarbons (PAHs).

Methods: The report included workers exposed to diesel exhausts (low PAH exposure level, n = 39) as well as those exposed to emissions from asphalt (medium PAH exposure level, n = 26) and coke ovens (high PAH exposure level, n = 28). Levels of Nap and Phe were measured in urine from each subject using head space-solid phase microextraction and gas chromatography-mass spectrometry. Published levels of airborne Nap, Phe and other PAHs in the coke-producing and aluminium industries were also investigated.

Results: In post-shift urine, the highest estimated geometric mean concentrations of Nap and Phe were observed in coke-oven workers (Nap: 2490 ng/l; Phe: 975 ng/l), followed by asphalt workers (Nap: 71.5 ng/l; Phe: 54.3 ng/l), and by diesel-exposed workers (Nap: 17.7 ng/l; Phe: 3.60 ng/l). After subtracting logged background levels of Nap and Phe from the logged post-shift levels of these PAHs in urine, the resulting values (referred to as ln(adjNap) and ln(adjPhe), respectively) were significantly correlated in each group of workers (0.71≤ Pearson r≤0.89), suggesting a common exposure source in each case. Surprisingly, multiple linear regression analysis of ln(adjNap) on ln(adjPhe) showed no significant effect of the source of exposure (coke ovens, asphalt and diesel exhaust) and further suggested that the ratio of urinary Nap/Phe (in natural scale) decreased with increasing exposure levels. These results were corroborated with published data for airborne Nap and Phe in the coke-producing and aluminium industries. The published air measurements also indicated
that Nap and Phe levels were proportional to the levels of all combined PAHs in those industries.

**Conclusion:** Levels of Nap and Phe in urine reflect airborne exposures to these compounds and are promising surrogates for occupational exposures to PAH mixtures.

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**ARTÍCULOS: ARCHIVOS DE PREVENCIÓN DE RIESGOS LABORALES**

*Arch Prev Riesgos Labor 2009; 12 (1): 14-18*

**Lipoatrofia semicircular de origen laboral**

*Mª Jesús Rodríguez Bayarria, Federico Madrid San Martín*

**RESUMEN**

**Objetivo:** En 2007 se notificaron en Cataluña una serie de casos de lipoatrofia semicircular potencialmente relacionados con determinados factores de riesgo presentes en los puestos de trabajo. El objetivo del presente trabajo es proponer una definición y clasificación de caso de lipoatrofia semicircular de origen laboral (LSOL) y describir los resultados de los casos estudiados en la Mutua Asepeyo en Cataluña.

**Métodos:** Se examinaron 153 trabajadores con sospecha de lipoatrofia semicircular con un mismo protocolo de actuación. Se describen los resultados de 148 casos atendidos consecutivamente y pertenecientes a 27 empresas diferentes. El estudio se llevó a cabo entre abril y septiembre de 2007.

**Resultados:** El mayor porcentaje de casos de lipoatrofia semicircular se da en mujeres (94%), con un rango de edad predominante para los dos sexos entre 31 y 41 años (46%), con normopeso (69%), con afectación en los muslos (96%) y en trabajadores con tareas administrativo-ofimáticas (97%) que referían apoyarse en la mesa de trabajo como factor de riesgo relacionado con su patología (58%). Adicionalmente, se objetiva el aumento de las cargas electrostáticas y la disminución de la humedad relativa ambiental en 19 casos procedentes de 6 empresas.

**Conclusión:** La vigilancia médica de los trabajadores afectados por lipoatrofia semicircular debe realizarse de forma protocolizada para identificar adecuadamente los casos de origen laboral. En nuestro estudio, el origen laboral del problema se ha podido determinar aproximadamente en la mitad de los casos. Aunque sigue sospechándose etiología laboral en la mayoría de los casos, ha sido imposible disponer, en esta fase del estudio, de las mediciones técnicas necesarias para identificar los factores de riesgo laborales considerados como potencialmente causales.

**PALABRAS CLAVE:** Lipoatrofia semicircular de origen laboral, salud laboral

- International Journal of Hygiene and Environmental Health
- Journal of Occupational and Environmental Medicine
- Safety Science