

034 - Comunicación Oral/Oral communication

Salud laboral

Occupational health

Sábado 4 de Octubre / Saturday 4, October
9:00:00 a/to 11:00:00

Moderador/Chairperson:
Marta Zimmerman

OCCUPATIONAL NOISE AND MYOCARDIAL INFARCTION: RESULTS FROM THE NAROMI (NOISE AND RISK OF MYOCARDIAL INFARCTION)-STUDY

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Introduction: Chronic noise exposure has been shown to be associated with increased catecholamine levels and with adverse effects on blood pressure and plasma lipids, and may eventually lead to the development of an acute MI. Only few longitudinal studies have examined chronic work noise as a risk factor for MI producing controversial results. In this analysis we present the results of the NaRoMI-Study regarding different parameters of work noise exposure and their association with MI.

Methods: In this case-control study, consecutive patients admitted to all 32 major hospitals in Berlin with acute MI were enrolled from 1998 to 2001. Controls were matched according to gender, age, and hospital (case: control ratio of 1:1 for men and 1:2 for women). In standardized computerized interviews information was obtained on workplaces, machines and type of hearing protection used at work. The 10 years work noise exposure (sound levels) were determined according to ISO 9921/1 assessing vocal effort for speech communication and according to catalogues for workplaces and machines. In multiple logistic regression models, the odds ratios (OR) and 95% confidence intervals (95%CI) of noise variables were adjusted for cardiovascular risk factors and sociodemographic variables.

Results: A total of 4,115 patients (3,054 men, 56+/-9 years, 1,061 women, 58+/-9 years) were included in the study. During the last 10 years 76.2 % of the women and 90.8 % of the men were employed continuously or intermittently. The sound level at work (according to vocal effort) was associated with increased risk of MI only in men exposed to >70-85 dB compared to the reference group (<=55 dB): adj. OR 1.37; 95%CI 1.01-1.85. Sound level assessments according to catalogues for workplaces/machines did not show a significant increase in risk of MI. On the contrary, after adjusting for possible confounders we found for men that sound levels >55 dB were associated with a significantly decreased risk of MI. Adjusting for environmental noise (subjective and objective parameters) did not substantially change the results for any of the work noise variables.

Conclusions: Our data suggests that work noise exposure may increase the risk of MI for men. The partly contrary findings for the sound level according to catalogues (in men only) indicate the need to use other assessments besides daily sound pressure level, e.g. disturbance of normal speech communication to evaluate the risks of cardiovascular disease due to work noise.

THE EFFECT OF SHIFT WORK ON BIRTH WEIGHT AND DURATION OF PREGNANCY: A PROSPECTIVE COHORT STUDY

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Introduction: Shift work may disturb normal bodily functions, either as a direct effect of changes in the circadian rhythm or indirectly through psychosocial stress and disturbed sleep, but their relation to pregnancy outcomes is poorly understood. We used the Danish National Birth Cohort (DNBC) to estimate the effect of maternal shift work on birth weight and duration of pregnancy.

Methods: From March 1, 1998 to May 1, 2000, 39913 pregnant women were enrolled in the DNBC. We identified 23149 singleton liveborn neonates for daytime workers, 760 for fixed evening workers, 272 for fixed night workers, 2185 for rotating shift workers (without night) and 2273 for rotating shift workers (with night) from the Hospital Discharge Registry. Information on job characteristics was obtained from the first interview (12-16 gestational weeks) and the second interview (30 gestational weeks). Gestational age was determined based upon the last menstrual period stated in the consentment form, the estimated delivery date given in the second interview and the recorded gestational age in the HDR. Birth weight was also recoded in the HDR. Both gestational age and birth weight were analysed as continuous endpoints by using linear regression and as dichotomous endpoints (including preterm birth, very early preterm birth, postterm birth, small-for-gestational-age, full-term low birth weight) by using logistic regression, with correction for potential confounders.

Results: Mean gestational ages were 181, 180 and 181 days for daytime work, fixed evening work and other types of shift work, respectively. There were no statistically significant differences in gestational age between any types of shift work and daytime work. However, when we restricted our analysis to primiparous women, fixed evening work showed shortened gestational age of -2.2 days (95% CI, -4.0, -0.3) and the risk of preterm birth was 1.5 (95% CI, 0.9, 2.4). We also found an increased risk of postterm birth for fixed night work (OR 1.4, 95% CI, 1.0, 1.9). Mean birth weights among full term births were 3.6 kg for both shift work and daytime work. The risks of full-term low birth weight were 1.1-1.6 for different types of shift work, but none of them showed statistical significance. When we applied our analysis to those mothers having the same work conditions in the second interview as in the first interview, the risk of small-for-gestational-age was 1.2 (95% CI, 1.0-1.3) for rotating shift work (with night).

Conclusions: Our results indicate that shift work in the second and third trimester of pregnancy has from slightly to moderately adverse effects on fetal growth and duration of pregnancy.

PSYCHOSOCIAL WORK ENVIRONMENT AND PSYCHOLOGICAL WELL-BEING AMONG EMERGENCY STAFF

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Background: To analyse the effect of the psychosocial work environment on the psychological well-being among emergency medical and nursing staff.

Methodology: A cross-sectional survey was carried out among 639 health personnel (doctors and nurses) who worked in emergency department. The information was collected by means a mail questionnaire. In order to evaluate the physical work load and psychosocial work environment we have used the Karasek and Theorell Job Content Questionnaire (JCQ). This include 6 dimensions: psychological demands, job control, co-workers social support, supervisors social support, static physical work load and dynamic one. Other explanatory variables were: characteristics related to gender role (gender, having children under 3 years, distribution of domestic chores and childcare, marital relationships, living or not with over-65-years-old adults) and social-professional characteristics (age, professional category, department, professional antiquity, type of contract). The outcome variable (psychological well-being) was evaluated with 2 dimensions of "SF-36 Health Survey": mental health (MEN) and vitality (VIT) and the dimension emotional exhaustion (EE) of Maslach Burnout Inventory (MBI). The 6 dimensions of JCQ and the dimension EE of MBI was categorised into high and low, from the values obtained in a uni-dimensional cluster analysis. The MEN and VIT were dichotomised (low, high), using the median of the scores as cutting point. The adjusted Odds ratio (OR) and their 95% confidence interval were calculated by logistical regression for each one of the outcome variables.

Results: Those exposed to high psychological demands present a higher probability of having bad MEN, OR 2.35 (1.58-3.49), low VIT, OR 1.99 (1.31-3.01), and high EE, OR 4.11 (2.77-6.11). Those exposed to low co-workers social support have a higher risk of bad MEN, OR 2.16 (1.38-3.38), low VIT, OR 1.95 (1.22-3.13), and high EE, OR 1.94 (1.22-3.08). The same trend was found for supervisors social support. Those exposed to low control have higher risk of EE, OR 1.79 (1.21-2.64). The risk of low VIT was higher in those exposed to high static physical work load, OR 1.58 (1.04-2.39). The risk of high EE was higher in those who were standing more than 8 hours. Doctors have more risk of bad MEN and low VIT than nurses. Those who have no very good marital relationship have a higher risk of bad MEN, OR 2.34 (1.47-3.70) and low VIT, OR 1.97 (1.24-3.13). Those who have domestic chores' arguments present more risk of bad MEN and low VIT. Gender was not associated with psychological well-being.

Conclusion: Psychosocial work environment has a negative influence on the psychological well-being of emergency medical and nursing staff. Gender-role-related variables (marital quality of life, domestic chores' arguments) have a negative influence on mental health and vitality.

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NECK-SHOULDER DISORDERS IN MEDICAL DOCTORS. THE EFFECT OF PSYCHOSOCIAL WORK ENVIRONMENT

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Objective: To determine the influence of psychosocial work environment on neck-shoulder disorders in hospital specialised medical doctors.

Methods: A cross-sectional study has been carried out. A random sample of specialised medical doctors from several Spanish Hospitals was selected. A mail questionnaire was used to collect information. The final sample includes 1021 physicians specialised in Oncology, Internal Medicine, Intensive Medicine, Traumatology and Radiology. The outcome variable was neck-shoulder disorders (NSD) reported during last 12 month. The explanatory variables were psychosocial work environment factors and socio-professional characteristics such as: age, medical speciality, professional category, professional antiquity, type of contract, gender, having children under 3 years, distribution of domestic chores and child-care, marital relationships, living or not with over-65-years-old adults). The psychosocial work environment was evaluated through a specific scale of job stressors for medical doctors developed by Graham et al, validated for this occupational group by the research team. A factorial analysis was used to confirm the dimensions of Graham's scale of job satisfaction. This scale has been categorized in 3 levels after applying a uni-dimensional cluster analysis. A descriptive analysis and logistic regression was carried out. Odds ratio (OR) and their 95% confidence interval were calculated.

Results: 42% of the 1021 physicians declared a NSD during last 12 months. The factorial analysis show that Graham's scale has five dimensions These dimensions were: Patients/family distress (PFD), feeling poorly managed and resourced (PMR), management responsibilities (MR), work overload (WL), and work effect on home life (WHL). These factors were categorized in high, medium and low level stressors. Those exposed to high WL showed a greater risk of NSD (OR 1.55 IC95% 1.06-2.25). Same result was observed for those with high WHL (OR 2.11 IC95% 1.47-3.03). No other psychosocial work environment factors showed to be related to NSD. Distribution of domestic chores was also related but in the limit of statistical significance

Conclusions: The psychosocial work environment has a negative influence on neck-shoulder disorders in medical doctors, specially those dimensions related with work overload and their effect on home life.

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MEDIUM- AND LONG-TERM REPRODUCIBILITY OF SELF-REPORTED EXPOSURE TO WORKPLACE ERGONOMIC FACTORS IN A COHORT OF AUTO WORKERS

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Introduction: Despite substantial evidence of an association between ergonomic exposures at the workplace and upper extremity musculoskeletal disorders (UEMSDs), one criticism concerns frequent assessment of exposure through worker self-report. Objectives of this study were: 1) to assess medium- and long-term test-retest reliability of self-reported exposure to physical stressors, in an occupational cohort; 2) to evaluate differences in reproducibility associated with UEMSD symptoms and other worker characteristics.

Methods: Subjects employed in automobile manufacturing were interviewed at baseline, one and six years later, about work history, occupational exposure to ergonomic factors, UEMSD symptoms, relevant injury and medical history, and demographics. To evaluate test-retest reliability of ergonomic exposures reported on separate interviews, ratings on single exposure items, and a composite exposure index, were dichotomized or divided into quartiles, and kappa coefficients, or weighted kappa coefficients, were computed. Weighted kappa coefficients for the composite index were also estimated by strata of subjects' characteristics: UEMSD status, functional impairment and pain severity, age, gender, ethnicity, systemic diseases, physical activity during leisure time, alcohol consumption, BMI, and seniority. Estimates in each category were compared using the z statistic.

Results: One-year reliability was computed on 507 workers who reported no change in job assignment or demands since baseline. The composite exposure index demonstrated fair reliability ($k=0.43$), while good agreement resulted for whole-body vibration ($k=0.52$), handling parts ($k=0.50$), and use of tools ($k=0.60$). In contrast, reproducibility was low (kappa coefficients <0.40) for work pace; total physical effort; weight of typical and heaviest parts handled; weight, balance and grip force of tools; size, pressure and vibration of tool handle. No subject characteristic significantly affected reproducibility of the exposure index, except gender ($p=0.048$). Six-year reproducibility, computed on 319 subjects, was low for the composite exposure index ($k=0.26$) and for each specific item investigated (range of $k = 0.13-0.37$); no workers' characteristic had a significant influence on long-term reliability.

Conclusions: We found acceptable medium-term reproducibility of self-reported ergonomic factors at work for the composite exposure index and for a few single exposure items, but low long-term reliability for all exposures investigated. Other researchers have generally reported higher reproducibility of self-reported physical factors at work, although most of them evaluated short-term test-retest reliability, which would be expected to be higher. These findings may have been affected by difficulty in identifying whether or not job assignments or demands truly had remained the same during a period in which production technology was steadily changing.

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PATERNAL EXPOSURE TO CHEMICAL, PHYSICAL AND BIOLOGICAL AGENTS IN SWEDISH BIOMEDICAL RESEARCH LABORATORIES AND CONGENITAL MALFORMATIONS AMONG THEIR OFFSPRING

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Introduction: Work in research laboratories involves exposure to chemical, biological and physical agents or combinations of them, and paternal exposure may be related to embryonic development through several suggested pathways. The aim of the study was to investigate paternal work in biomedical research laboratories and the influence from different types of exposure on major and cranial neural crest malformations in their offspring.

Methods: The study population was derived from a source cohort of male employees working at four Swedish Universities between 1970-1989, including information about work exposures collected by questionnaires to the research group leaders. Linkage was performed to the Swedish Multifamily Register to identify the female partners and thereafter to the Swedish Medical Birth Registry (MFR). The exposure was classified as laboratory work in general (2216 versus 1918 referent births), as well as according to use of specific agents e.g. biological agents, radioactive isotopes, solvents, and carcinogens (classified according to IARC - International Agency for Research on Cancer). Information about specific exposures was available for 1298 births. "Major malformations" as defined in the MFR and cranial neural crest malformations as defined in previous studies based on International Classification of Diseases (ICD), were used. Information about potential maternal confounding factors such as age, smoking, parity, previous reproductive failure, and chronic diseases were available. Odds ratios (OR) and 95% confidence intervals (CI) were calculated using uni- and multivariate logistic regression and STATA Software 7.0.

Results: The total number of major malformations among offspring to male university employees was 81 (2.0% of exposed, 1.9% of referent births) and cranial neural crest malformations 23 (0.5% of exposed, 0.6% of referent births). When information of specific exposures was analysed, the number was 59 and 20 respectively. Laboratory work in general was not associated with increased risk for malformations. Crude odds ratios for major malformations were slightly elevated when working with solvents before birth (1.3 CI 0.7-2.2) and with carcinogens, IARC group 1 (1.6 CI 0.8-3.2), as well as for cranial neural crest malformations, OR1.6 (CI 0.7-3.9) and 2.6 (CI 1.0-7.3), respectively. A model including specific exposures, adjusted for mothers' age, consecutive pregnancy number, and previous spontaneous abortions gave the following odds ratios: solvents: 2.4 (CI 0.7-8.4); carcinogens - IARC group 1: 3.1 (CI 0.9-11.3); radioactive isotopes: 0.3 (CI 0.1-1.3); DNA: 0.4 (CI 0.0-3.7) and bacteria 1.7 (CI 0.3-8.8). However, the analysis of "other major malformations than cranial neural crest" indicated an elevated OR with work with radioactive isotopes during the period around pregnancy (2.4 CI 1.0-5.8, unadjusted).

Conclusions: Laboratory employment in general did not indicate any increased risk for malformations, but there were elevated ORs for major malformations and cranial neural crest malformations in offspring when the father was working with solvents and/or carcinogens.

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MALFORMATIONS IN CHILDREN OF FEMALE WORKERS FROM NON-FERROUS METALLURGY

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Aims: This epidemiological study was performed to assess the relationship between the long-term exposure of female workers in non-ferrous metallurgy and the frequency as well as type of malformations found in their children. Non-ferrous metallurgy is one of the most polluting industrial branches today. The workers are exposed to cumulative noxious effects of Pb, Cd, Zn, As, of which the most significant is Pb.

Methods: The Pb and Cd levels in the air of the workplaces were monitored during a 12-year period. 98 exposed female workers from a metallurgical factory were compared with 98 non-exposed females, regarding their own and their children's health status. The following laboratory examinations were done: blood-Pb, Cd; urinary-Pb, Cd; urinary-DALA. Furthermore, a computerized epidemiological questionnaire was used to determine the frequency and type of malformations in children. The recorded data were correlated with malformation generating risk factors such as age, exposure time, smoking, and alcohol intake. These risk factors were evaluated using a Comparative Score Method. Linear regression analysis was done to find out the relationship between exposure and the frequency of malformations in children.

Results: The Pb and Cd levels in the air of all workplaces were constantly high (Pb=1.1-29.9 mg/m³; Cd=0.2-1.6 mg/m³) during the study. The values of biomarkers of exposure and of biological effects in exposed females were above the normal values compared to the National Standards (blood-Pb=42.5±3.6 µg/dL; blood-Cd=1.9±0.7 µg/dL; urinary-Pb=187.7±12.2 µg/L; urinary-Cd=6.8±1.5 µg/L; urinary-DALA=22.5±2.1 mg/L). The frequency of malformations in children of exposed females was significantly higher ($p<0.05$) compared to malformations found in children of non-exposed females. The more frequent malformations were mental retardation (7.8%), cardiovascular and eye malformations (both 2.5%) and urogenital malformations (2.1%). Scores given to malformation-generating risk factors as age, smoking, alcohol intake regarding the two groups were almost similar ($p=NS$). Linear regression analysis suggested a positive correlation between the level of exposure and level of biological effects, as well as between the biomarkers of exposure and frequency of malformations (mental retardation).

Conclusions: Long-term Pb and Cd exposure is considered to be a risk factor for malformations in children of female workers in non-ferrous metallurgy. Predominantly blood-Pb levels and urinary-DALA values are positively associated with mental retardation in children of exposed females. It is recommended to reduce the Pb and Cd levels in all workplaces to prevent children's malformations due to these noxious metals.

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MORTALITY AMONG AIRLINE CABIN CREW IN EUROPE

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Introduction: There is concern about health effects of cosmic radiation during air travel. To study potential health effects of this and occupational exposures, we investigated mortality patterns among 45,000 cabin-crew members in Europe.

Methods: A retrospective cohort study was performed in eight European Countries (Denmark, Finland, Greece, Germany, Iceland, Italy, Norway, Sweden), yielding 650,000 person-years. We calculated Standardised Mortality Ratios (SMR) comparing observed deaths with expected numbers based on national mortality rates. The cohort was also analysed using duration of employment as proxy for occupational exposures.

Results: The cohort consisted of 33,063 female and 11,079 male cabin crew members. Among female cabin-crew overall mortality ($n=441$; SMR 0.80, 95% CI 0.73 - 0.88) and all-cancer mortality ($n=171$; SMR 0.78, 95% CI 0.66 - 0.95) were slightly reduced while breast cancer mortality was slightly increased (SMR 1.11, 95% CI 0.82 - 1.48). Among male cabin crew, overall mortality ($n=571$; SMR = 1.09, 95% CI 1.00 - 1.18) and mortality from skin cancers (SMR malignant melanoma = 1.93, 95%CI 0.70 - 4.44) was somewhat increased. We noted excess mortality from aircraft accidents, and from AIDS in males. Cardiovascular mortality was low in both sexes. There was no evidence of increasing mortality with increasing duration of employment.

Conclusions: We found little evidence that cosmic radiation or other occupational exposures lead to increased mortality among airline cabin crew in Europe. Skin cancer risk among male crew requires further research, and the AIDS situation should be monitored.