Abstracts

Oral Presentation

Shift Work

0333 NIGHT SHIFT WORK AND BREAST CANCER RISK: A COMBINED ANALYSIS OF POPULATION-BASED CASE-CONTROL STUDIES WITH COMPLETE WORK HISTORIES

1Emile Cordina-Duverger*, 1Florence Menegaux, 1Aboubakari Nambiema, 2Sylvia Rabstein, 3Volker Harth, 2Beate Pesch, 2Thomas Brüning, 2Un Fritschi, 2Deborah Glass, 3Jane Heyworth, 3Thomas Erren, 4,6Gemma Castaño-Vinyals, 4,9Kyriaki Papantoniou, 8,9Ana Espinosa, 6,9Manolis Kogevinas, 13Anne Grundy, 11John J Spinelli, 12Kristan I Aronson, 13Pascale Guénée. 1INSERM, CESP (UMR5108) Paris-Sud University, Paris Sud University, Villejuif, France; 2Research Institute of Occupational Medicine of the German Social Accident Insurance (BGFA), Ruhr University Bochum, Bochum, Germany; 3Institute for Occupational and Maritime Medicine (IZAM), University Medical Centre Hamburg-Eppendorf (UKE), Hamburg, Germany; 4,6Western Australian Institute for Medical Research, University of Western Australia, Perth, Australia; 5Department of Epidemiology and Preventive Medicine, School of Public Health and Preventive medicine, Monash University, Melbourne, Australia; 5School of Population Health, The University of Western Australia, Nedlands, Australia; 6Institute of Public Health and Preventive Medicine, University of Cologne, Germany; 6Global Centre for Research in Environmental Epidemiology, IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain; 7Department of Epidemiology, Medical University of Vienna, Vienna, Austria; 8Universitat Pompeu Fabra (UPF), Barcelona, CIBER Epidemiología y Salud Pública (CIBERESP), Madrid, Spain; 9Department of Cancer Control Research, Cancer Agency; School of Population and Public Health, University of British Columbia, Vancouver, British Columbia, Canada; 10Department of Public Health Sciences and Queen’s Cancer Research Institute, Queen’s University, Kingston, Ontario, Canada; 11Department of Social and Preventive Medicine, Université de Montréal, Montreal, Canada.

In 2007, IARC classified “shift work that involves circadian disruption” as probably carcinogenic to humans. To date, the evidence that night shift work increases the risk of breast cancer remains limited, partly because exposure to night work is defined differently across studies. To overcome this limitation, we created a single harmonised dataset using a common definition of night work from 5 major population-based case-control studies on breast cancer in Australia, Canada, France, Germany, and Spain.

The dataset included 6000 breast cancer cases and 7000 population controls. Any job held during work history that included at least 3 hours between midnight and 5 am was classified as night work. Lifetime duration of night work, frequency (nights/week), and night shift length (hours) were used as the main exposure variables.

In pre-menopausal women who ever worked at night the pooled OR was 1.23 [1.03–1.47]. The OR increased to 1.75 [1.17–2.62] in premenopausal women who worked at least 3 nights/week and 1.33 [1.05–1.70] for night shifts ≥10 hours. The OR did not increase with the number of years of night work, but women who worked ≥3 nights/week for ≥10 years had an OR of 2.38 [1.05–6.36]. No association emerged from the data in post-menopausal women. No statistically significant heterogeneity between studies was observed.

Our results support the hypothesis that night work increases breast cancer risk, particularly in pre-menopausal who worked at least 3 nights per week. The absence of an association in post-menopausal women needs further scrutiny.

0335 TNF-α GENE POLYMORPHISMS MAY BE ASSOCIATED WITH INTERACTIVE EFFECTS OF BLOOD MULTI-ELEMENTS IN METAL INDUSTRIAL WORKERS

1Huang-Yi Chuang*, 2Yi-Hua Chen, 2Jyh-Jong Huang. 1Department of Occupational and Environmental Medicine in Kaohsiung Medical University Hospital, Kaohsiung, Taiwan; 2Kaohsiung Medical University, Kaohsiung, Taiwan; 3Department of Family Medicine in Kaohsiung Municipal Ta-Tung Hospital, Kaohsiung, Taiwan; 4Department of Family Medicine in Kaohsiung Medical University Hospital, Kaohsiung, Taiwan.

10.1136/oemed-2017-104636.274

Chronic exposure to metals or toxic elements may contribute to many diseases. Lead (Pb), cadmium (Cd), and arsenic (As) were toxic agents in the environment. Selenium (Se), cobalt (Co), copper (Cu), and zinc (Zn) are essential trace elements for human, but they may do harm to health beyond normal concentrations. The interactions among multiple elements are complicated and remain unclear. Toxic elements may cause a threat through inflammation. Tumour necrosis factor-α (TNF-α) is an important mediator of inflammation, and several single nucleotide polymorphisms (SNPs) have been identified in the human TNF gene promoter. Our aim is to analyse how TNF-α gene polymorphisms and multi-elements interaction influence serum TNF-α level. A total of 462 metal industrial workers who have received health examination in Kaohsiung Medical University Hospital were recruited. The blood samples were sent for biochemical analyses, TNF-α genotype analyses (~238G>A, ~308G>A, ~857C>T, ~863C>A, ~1031T>C), and measurement of blood multi-elements concentrations (Pb, Cd, As, Se, Co, Cu, Zn) and serum TNF-α level. Mixed-effect models were used for analysing complex interactions of multi-elements and multiple TNF-α SNPs. All elements have positive correlation with serum TNF-α level, and the effects may be modified by TNF-α gene polymorphisms. Interactions between TNF-α gene polymorphisms and multi-elements may influence serum TNF-α level. We suggest that the workers with susceptible TNF-α genotypes which may induce higher serum TNF-α level should pay more attention to metal toxicity.

Oral Presentation

Ageing Workforce

0336 IMPACT OF JOB GROUP ON RISK OF RETIREMENT IN DENMARK 1980–2012

1 Eskib Meulengracht Flachs Flachs*, 1 Johni Hansen, 1 Esben Budtz Jorgensen, 4 Henrik Albert Kirkegaard, 5 Ole Seilie, 6 Enrico Bonato Petersen, 1 Vivi Schlüters, 4 Susanne Wulf Svendsen, 1 Jens Peter Elklide Bronte. 1 Department of Occupational and Environmental Medicine, Bispebjerg University Hospital, Copenhagen, Denmark; 2 The Danish Cancer Society, Copenhagen, Denmark; 3 Department of Biostatistics, Copenhagen University, Copenhagen, Denmark; 4 Department of Occupational Medicine, Aarhus University Hospital, Aarhus, Denmark; 5 The Danish National Research Centre for the Working Environment, Copenhagen, Denmark; 3Department of Occupational Medicine, Herning Hospital, Herning, Denmark.

10.1136/oemed-2017-104636.275

Chronic exposure to metals or toxic elements may contribute to many diseases. Lead (Pb), cadmium (Cd), and arsenic (As) were toxic agents in the environment. Selenium (Se), cobalt (Co), copper (Cu), and zinc (Zn) are essential trace elements for human, but they may do harm to health beyond normal concentrations. The interactions among multiple elements are complicated and remain unclear. Toxic elements may cause a threat through inflammation. Tumour necrosis factor-α (TNF-α) is an important mediator of inflammation, and several single nucleotide polymorphisms (SNPs) have been identified in the human TNF gene promoter. Our aim is to analyse how TNF-α gene polymorphisms and multi-elements interaction influence serum TNF-α level. A total of 462 metal industrial workers who have received health examination in Kaohsiung Medical University Hospital were recruited. The blood samples were sent for biochemical analyses, TNF-α genotype analyses (~238G>A, ~308G>A, ~857C>T, ~863C>A, ~1031T>C), and measurement of blood multi-elements concentrations (Pb, Cd, As, Se, Co, Cu, Zn) and serum TNF-α level. Mixed-effect models were used for analysing complex interactions of multi-elements and multiple TNF-α SNPs. All elements have positive correlation with serum TNF-α level, and the effects may be modified by TNF-α gene polymorphisms. Interactions between TNF-α gene polymorphisms and multi-elements may influence serum TNF-α level. We suggest that the workers with susceptible TNF-α genotypes which may induce higher serum TNF-α level should pay more attention to metal toxicity.
Objectives Age at permanent retirement is of interest both from an occupational health perspective as an indicator of health risks and from a societal perspective, where keeping an ageing population at work is a priority. The Danish nationwide individual level database DOC* X includes labour market affiliation and job type for employed residents in Denmark in the years 1970–2012. The aim of this study is to investigate differences in retirement between job titles.

Methods Data on permanent retirement was obtained from administrative registries for the years 1980–1990 and 1994–2012. Each job title was coded by the Danish version of the International Standard Classification of Occupations (DISCO-88). We calculated mean age at retirement in years (MAR) according to five year periods and DISCO-88 groups (first digit).

Results The number of employed persons varied between 2.0 and 2.7 million yearly, whereof job title was identified for around 75%.

MAR was substantially higher among persons with non-manual compared to manual jobs (men: 64.6 versus 61.6 years) and (women: 63.3 versus 60.8 years). In 2011–2012 SRR was between 0.44 and 1.55 for women and 0.40 and 1.12 for men. Manual jobs had consistently increased SSR throughout the study period, but the relative difference between manual and non-manual jobs increased from 2.0 in the early 1980’s to 5.4 in the mid-1990’s and decreased to 1.9 in the latest years.

Conclusion Manual jobs have an increased standardised retirement risk and a lower mean age of retirement compared to non-manual jobs.

Oral Presentation

Exposure Assessment

0339 MODELLING OF OCCUPATIONAL EXPOSURE TO INHALABLE NICKEL

Benjamin Kendzia, Beate Pesch, Dorothea Koppisch, Rainer Van Gelder, Katrin Pitzke, Wolfgang Zschiesche, Tobias Weiss, Thomas Behrens, Thomas Brüning. Institute for Prevention and Occupational Medicine of the German Social Accident Insurance, Institute of the Ruhr-Universität Bochum (IPA), Bochum, Germany; Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA), Sankt Augustin, Germany

Objectives Exposure to nickel (Ni) is widely distributed in the production and processing of steel or alloys. We compiled concentrations of inhalable Ni together with information about the duration of the measurement, analytical method, and workplace characteristics in the MEGA database.

Methods This analysis was based on 8052 personal measurements of inhalable Ni collected between 1990 and 2009. Mixed-effects models were applied to the log-transformed Ni concentrations with imputed non-detects to assess the geometric means (GMs) of exposure to Ni in the various occupational settings adjusted by duration of sampling and calendar year.

Results Most of measurements (38%) were collected in welders, which we further detailed by welding technique. Major predictor of the concentration was the technique and material in welding-related tasks. Highest exposure levels were estimated for welding materials of high Ni content with gas metal arc welding (48 µg/m³; 95% CI 32–72 µg/m³) and shielded metal arc welding (37 µg/m³; 95% CI 24–57 µg/m³). Furthermore, high GMs were estimated in metal sprayers (33 µg/m³), in the manufacture of batteries (27 µg/m³) and in forging-press operators (25 µg/m³). We did not observe time trends of exposure to Ni in this period.

Conclusion Ni concentrations varied considerably between occupations and were influenced by process and Ni content of consumables in welders. In order to assess exposure to Ni in community-based studies, supplemental information on job tasks, processes and materials is essential in addition to job titles.