

O30 - Comunicación Oral/Oral communication

Cáncer y ocupación

Occupation and cancer

Viernes 3 de Octubre / Friday 3, October
18:00:00 a/to 19:30:00

Moderador/Chairperson:
Benedetto Terracini

COOKING AND UVEAL MELANOMA RISK: RESULTS FROM TWO CASE-CONTROL STUDIES IN GERMANY

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Objective: Recently, Guenel et al. observed that within the group of service workers who had an increased risk of uveal melanoma, male cooks had an odds ratio of 3.8 (95% confidence interval: 0.7-19.7). We recently published the results of two German case-control studies on uveal melanoma that showed that men working as food, beverage and tobacco processors for at least 6 months had an elevated risk of uveal melanoma (OR=4.7, 95% confidence interval: 1.0-22.0). The corresponding analyses of the industry branches showed an increased uveal melanoma risk for men working in the food industry (OR=3.4, 95% CI: 1.1-10.5) (8). Because of these findings we explored the association between cooking and risk of uveal melanoma in the two German case-control studies. Here we present the findings of the detailed analysis.

Methods: We conducted a hospital and population-based case-control study of uveal melanoma and occupational exposures. We then pooled these results. Overall, 118 cases and 475 controls matching on age, sex and study regions were interviewed. We classified subjects as exposed to an occupational category (i.e. cooks) if they had ever worked within this category for at least 6 months or more. Subjects who had worked as cooks according to the International Standard Classification of Occupations (ISCO-68) were rated as either a) having prepared food without having cooked and therefore unexposed to cooking or b) having cooked. We used conditional logistic regression models to calculate pooled odds ratios (OR) and 95% confidence intervals (95% CI).

Results: Subjects who had cooked at least six months at their job had an odds ratio of 6.1 (95% CI: 1.7-22.2). Cooking was associated with an OR of 4.0 (95% CI: 0.8-20.1) for a job duration of 0.5-2 years and with an OR of 11.4 (95% CI: 1.6-81.9) for a job duration more than 2 years. The presence of extractor hoods above cookers did not substantially alter the odds ratio estimates.

Conclusions: In light of the similar finding in other studies, the association deserves further attention. Several exposures of cooks including strong light from incandescent ovens, infrared radiation and microwave might be relevant. Due to the low exposure prevalences of microwave use by cooks (3 controls, 1 case) we cannot give any insights in the possible role of microwaves among cooks. A further possible mechanism may be the exposure to carcinogens formed during the cooking of foods.

Partially supported by a grant from the Federal Ministry of Education and Research, Germany (Bundesministerium für Bildung und Forschung, BMBF, No. 01HP 684/8).

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OCCUPATIONAL EXPOSURE TO CHEMICAL AND SENSITISING AGENTS, AND RISK OF MULTIPLE MYELOMA (MM) IN SWEDEN

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Background: Several studies have suggested that occupational exposures could increase the risk of multiple myeloma (MM). A possible role of chronic stimulation of the immune system in its aetiology has also been proposed. Our aim was to test these hypotheses by estimating occupational risks of MM by job titles and to analyse specifically occupational exposure to selected chemicals and sensitising agents.

Methods: The historical cohort of all Swedish citizens recorded in the 1960 census, who were gainfully employed and over 24 years old in 1970 (1,779,646 men/1,066,346 women) was followed during 1971-1989 by record linkage with the Swedish National Cancer and Death registers. Occupational and demographical data from the 1970 census were used to estimate risks ratios (RRs) of MM for each job title using all workers as referent, with men and women analysed independently. Occupational codes were linked with a) a Swedish job-exposure matrix (JEM), assigning exposure to 13 different chemicals for all combinations of occupations and industry, covering around 90% of all workers, and b) a newly developed JEM assessing low and high probability of exposure to sensitising agents of low molecular weight (MW) and of high MW. Log-linear Poisson models were used to obtain RRs adjusted for age, period and geographical area.

Results: During the follow-up, 4409 MM cases were identified (3127 men and 1282 women). Jobs with a statistically significant $RR \geq 1.50$ and at least 5 cases were considered. In men elevated risks were found for bakers/pastry cooks, stone cutters/carvers, dental technicians and prison/reformatory officials. In women high risks were obtained for attendants in psychiatric care, toolmakers/machine-tool setters/operators, other engineering/building metal work, paper/paperboard product workers and bakers/pastry cooks. While we did not find association of MM with regular exposure to pesticides/herbicides, a significant excess risk of MM for exposure to short-term high exposure peaks of pesticides was observed in both men ($RR=1.20$; 95%CI: 1.07-1.35) and women ($RR=1.79$; 95%CI: 1.06-3.04). A borderline significant RR was found associated with probable or possible exposure to solvents in women ($RR=1.28$; 95%CI: 0.90-1.83) and with probable exposure in men ($RR=1.11$; 95%CI: 0.92-1.35).

An increased risk of MM was detected in subjects with a high probability of exposure to high MW sensitisers both in men ($RR=1.45$; 95%CI: 1.06-1.98) and in women ($RR=1.59$; 95%CI: 1.02-2.49), after adjustment for exposure to low MW sensitisers. MM was not related with exposures to low MW sensitisers.

Conclusion: The high risk of MM found in both female and male bakers has not been described in other studies. Occupational exposures to high peaks of pesticides or solvents might increase the risk of MM in both sexes. The association of MM with exposure to high MW sensitisers could support the role of chronic immunogenic exposures in MM aetiology.

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OCCUPATIONAL RISK FACTORS FOR ADULT BONE CANCER IN A EUROPEAN MULTICENTRIC CASE-CONTROL STUDY

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Introduction: Aim of the study was to investigate the role of occupational factors in the etiology of adult bone cancer, a rare tumour with few known risk factors.

Methods: Within the framework of a multicentric study on seven different rare cancers, involving seven European countries (Denmark, Sweden, France, Germany, Italy, Spain and Portugal), incident cases of bone cancer, aged between 35 and 70 years old, were recruited between 1995 and 1997. The eligibility of cases was confirmed by a centralized pathologist and the study was restricted to osteosarcomas and chondrosarcomas. A set of controls, frequency-matched by age and study area, was selected from population registries (in all countries, but Spain and Portugal) or among hospitalized patients with diagnosis of colon cancer (Spain) and colon or stomach cancer (Portugal). All subjects were asked in a face-to-face or telephone interview questions about their lifestyle habits, medical and occupational history. Job titles and branches of industry were recorded for each occupational period and coded blindly to case-control status according to the International Classification of Occupations (ISCO) and the European Classification of Industries (NACE). In addition, in-depth questions were asked for some specific occupational exposures selected on the basis of previous evidence on risk factors for the seven rare cancer forms included in the multicentric study. We estimated odds ratios (OR) associated with ISCO/NACE codes and selected occupational exposures (SAS software).

Results: Preliminary analyses included 92 cases and 2,554 controls. Occupations at increased risk for bone cancer were architects and engineers (OR: 2.25, 95% confidence interval [CI]: 0.84-7.75; based on 4 exposed cases), paper makers (OR: 3.36, 95% CI: 0.95-11.9; 3 cases) and blacksmiths, toolmakers and machine-tool operators (OR: 2.16, 1.13-4.16; 13 cases). Elevated risks were found for having been employed in manufacture of wood and wood products (OR: 3.00, 95% CI: 1.42-6.37; 9 cases), manufacture of chemicals (OR: 1.70, 95% CI: 0.65-4.40), manufacture of machinery and equipment not elsewhere classified (NACE code 29; OR: 1.74, 95% CI: 0.88-3.41, 11 cases) and construction industry (OR: 1.63, 85% CI: 0.96-2.77, 23 cases). Sixteen cases were occupationally exposed to pesticides, corresponding to an OR of 2.25 (95% CI: 1.29-3.91).

Conclusions: This study suggests some associations, in particular with employment in manufacture of wood industry and exposure to pesticides.

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HIGHEST RISKS OF PLEURAL MESOTHELIOMA AMONG ASBESTOS END-USERS: A FRENCH COMMUNITY-BASED CASE-CONTROL STUDY (1998-2002)

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Introduction: Association between pleural mesothelioma and occupational exposure to asbestos is well known, but distribution of related jobs (defined as an occupation in an industry) with high risks is still under-described in France. This study points out the highest risks of pleural mesothelioma among asbestos end-users according to major groups of occupations and industries.

Methods: A community-based case-control study of pleural mesothelioma has been conducted since 1998 in 19 French administrative departments included in the National Program of Mesothelioma Surveillance : 369 cases (82% males) confirmed by a panel of pathologists, and 536 controls (matched for sex, age and department of residence) were personally interviewed at home by trained interviewers. Occupational risks for men were analysed separately for major groups of occupations and industries according to international standard classifications (ISIC and ISCO). Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated by using an ever versus never employment concept.

Results: Among industries, highest risks were observed for shipbuilding and repair (OR=9.1, 95% CI 7.8-10.6), building industry and installation (OR=7.0, 95% CI 6.0-8.1), chemical plants (OR=5.1, 95% CI 4.4-6.0), manufacture of fabricated machinery (OR=4.4, 95% CI 3.7-5.1), manufacture of fabricated metal products (OR=4.3, 95% CI 3.8-4.9), basic metal industries (OR=3.8, 95% CI 3.2-4.5) and aircraft manufacture (OR=3.3, 95% CI 2.7-3.9). Among occupations, highest risks were observed for plumbers, pipe fitters and welders (OR=9.9, 95% CI 8.3-11.8), electrical installers (OR=5.3, 95% CI 4.4-6.4), sheet metal workers (OR=4.6, 95% CI 4.0-5.3), other machinery fitters-assemblers and precision instrument makers (OR=4.5, 95% CI 3.9-5.3), electrical and electronic fitters (OR=4.0, 95% CI 3.3-5.0), cabinetmakers and related woodworkers (OR=3.8, 95% CI 3.1-4.7) and labourers not qualified (OR=3.5, 95% CI 3.0-4.2).

Conclusions: Due to persistent asbestos exposure of end-users until the late nineties and important number of related workers, our results clearly emphasized the expected increase of pleural mesothelioma incidence in France in the next 20-30 years.

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FRACTION OF DEATHS FROM LUNG CANCER ATTRIBUTABLE TO OCCUPATIONAL ASBESTOS EXPOSURE AMONG FRENCH MALE IN FRANCE, PERIOD 1970-2000

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Introduction: Estimating the number of deaths attributable to specific exposure is important for the definition of public health and prevention strategies. In occupational epidemiology, this is particularly valuable in order to help for the recognition of and compensation for work-related diseases. Therefore, our objective was to estimate the fraction of deaths from lung cancer attributable to occupational asbestos exposure in the French male population, for the period 1970-2000.

Methods: A representative sample of French male population was constituted from controls of 15 case-control studies. For each subject, his job history was known and his history of asbestos exposure was reconstructed by crossing the latter with a French job-exposure matrix. The expected number of lung cancer deaths without exposure (A) was computed from the French specific mortality data. The number of death with exposure (B) was estimated by using the same mortality rates multiplied by the relative risk (RR) associated with exposure (being considered as present vs. nil). As reported in previous studies, two different values of this RR were assumed: (1) $RR=1.5$, or (2) $RR=2.3$. The attributable fraction was then: $(B-A)/B$. Our estimates was further validated, using a linear no-threshold relation between the cumulative level of asbestos exposure and the RR of death from lung cancer.

Results: 6,045 men were included in our sample, for the period 1970-2000, accounting for 119,287 at-risk person-years. The mean age for total person-year was 47 years; 18% had a non zero cumulative asbestos exposure. The expected number of lung cancer deaths without exposure was 57.8. According to the RR assumed, the expected number of deaths (taking into account exposure) was respectively 62.9 (1) and 71 (2), with an estimated attributable fraction of 9% (1) and 18.6% (2), respectively. This range was similar with the one estimated using the linear approach mentioned above.

Conclusions: When applying this fraction to the total number of lung cancer deaths among French male in year 2000, between 900 and 2,000 deaths should have been attributable to occupational asbestos exposure. This figure is much higher than the annual number of cases of lung cancer recognised and compensated as asbestos-related occupational diseases in France.

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RISK FACTORS FOR CUTANEOUS MALIGNANT MELANOMA AMONG AIRCREWS AND A RANDOM SAMPLE OF THE POPULATION

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Introduction: Malignant melanoma has been found in excess among commercial aircrew in several incidence as well as mortality studies where the cohorts have been compared to the general population. In studies on aircrews the occupational exposure of greatest concern was cosmic radiation, however the crews have a complicated exposure where different occupational or life-style related exposure factors have been considered confounders to the possible effect of cosmic radiation. Aircrew exposure to UV radiation has not yet been documented, although information on the increased risk of non-melanoma and melanoma skin cancers among them has been accumulating for more than ten years. The aircrews' potential exposure to UV radiation in a magnitude that would explain the increased skin cancer risk will have to occur during their leisure time, as UV radiation does not penetrate into the cockpit. The objectives of the present study was to evaluate whether a difference in the prevalence of risk factors for malignant melanoma in a random sample of the population and among pilots and cabin attendants could explain the increased incidence of malignant melanoma which had been found in previous studies.

Methods: A questionnaire was used to collect information on hair colour, eye colour, freckles, number of naevinaive, family history of skin cancer and naevi, skin type, history of sunburn, sunbed and sunscreen use and number of sunny vacations. Predictive values of malignant melanoma risk were calculated for evaluating possible confounding due to the prevalence of the risk factors.

Results: The 239 pilots were all males and there were 856 female cabin attendants, which were compared with 454 males and 1464 females of the same age drawn randomly from the general population. The difference in constitutional and behavioural risk factors for malignant melanoma between the aircrews and the population sample was not substantial. The aircrews had more often used sunscreen and had taken more sunny vacations than the other men and women. The predictive values for use of sunscreen were 0.88 for pilots and 0.85 for cabin attendants and the predictive values for sunny vacation were 1.36 and 1.34 respectively.

Conclusion: For prevalence's of risk factors for malignant melanoma, in the present study, we have not found substantial difference between the aircrew and the random sample of the population. Thus it is unlikely that the increased incidence of malignant melanoma found in previous studies of pilots and cabin attendants can be solely explained by excessive sun exposure. There is an urgent need to evaluate further the role of the exposure of aircrews to cosmic radiation as well as possible increased melanoma risk among passengers and frequent flyers.

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CANCER INCIDENCE AMONG NORDIC AIRLINE PILOTS OVER 50 YEARS

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Commercial airline pilots are exposed to cosmic radiation and other potentially carcinogenic elements at work or leisure. A cohort of 10,051 male and 160 female airline pilots from Denmark, Finland, Iceland, Norway and Sweden was followed for cancer incidence through the national cancer registries. Standardized incidence ratios (SIRs) were defined as ratios of observed over expected numbers of cases, the latter ones based on national cancer incidence rates. Dose-response analyses were done with Poisson regression method.

Among male pilots, there were 466 cases of cancer diagnosed vs. 456 expected. The only significantly increased SIRs concerned skin cancer: melanoma 2.3 (95% CI 1.7-3.0), squamous cell cancer 2.1 (1.4-3.1), and basal cell carcinoma 2.5 (1.9-3.2). The relative risk of skin cancers increased with the time since the time of first employment, with the number of flight hours, and with the estimated radiation dose. There was an increase in relative risk of prostate cancer with increasing number of flight hours in long-distance aircraft (p trend 0.01). No increased incidence was found for acute myeloid leukemia.

This large study, based on reliable cancer incidence data, showed an increased incidence of skin cancer. It does not indicate a marked increase in cancer risk attributable to cosmic radiation. The Nordic collaborative study will continue with a similar analysis of over 30,000 cabin crew persons.