

of injury), while most reported verbally (58.9%) to coworkers/managers or documented in the patient's chart (14.9%).

**Conclusion** While the prevalence and number of violent events was high, the reporting of events by workers into a formal system was low. Reporting systems developed specifically for capturing type II violent events are needed for purposes of informing and evaluating targeted workplace violence prevention strategies.

## Session: 30. Lymphoma and leukemia

### 377 OCCUPATION AND RISK OF LYMPHOID AND MYELOID LEUKEMIA IN THE EUROPEAN PROSPECTIVE INVESTIGATION INTO CANCER AND NUTRITION (EPIC)

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**Objectives** Established risk factors of leukemia do not explain the majority of leukemia cases. Previous studies have suggested the importance of occupation and related exposures in leukemogenesis. We evaluated possible associations between job title and selected hazardous agents and leukemia in the European Prospective Investigation into Cancer and Nutrition.

**Methods** The mean follow-up time for 241,465 subjects was 11.20 years (SD: 2.42 years). During the follow-up period, 477 incident cases of myeloid and lymphoid leukemia occurred. Data on 52 occupations considered *a priori* to be at high risk for developing cancer were collected through standardized questionnaires. Occupational exposures were estimated by linking the reported occupations to a Job exposure matrix. Cox proportional hazard models were used to explore the association between occupation and related exposures and risk of leukemia.

**Results** Risk of lymphoid leukemia significantly increased for working in chemical laboratories (HR = 8.35, 95% CI = 1.58–44.24), while the risk of myeloid leukemia increased for working in the shoes or other leather goods industry (HR = 2.54, 95% CI = 1.28–5.06). Exposure specific analyses showed a non-significant increased risk of myeloid leukemias for exposure to benzene (HR = 1.15, 95% CI = 0.75–1.40; HR = 1.60, 95% CI = 0.95–2.69 for the low and high exposure categories respectively). This association was present both for acute and chronic myeloid leukemia at high exposure levels. However, numbers were too small to reach statistical significance.

**Conclusion** Our findings suggest a possible role of occupational exposures in development of both lymphoid and myeloid leukemia. Exposure to benzene seemed to be associated with both acute and chronic myeloid leukemia.

### 378 OCCUPATION AND RISK OF NON-HODGKIN LYMPHOMA (NHL) AND SUBTYPES: A POOLED ANALYSIS FROM THE INTERLYMPH CONSORTIUM

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**Objectives** A range of occupations have been associated inconsistently with an elevated NHL risk. In this large, pooled study, we investigate the relationship between occupation and NHL and NHL subtypes.

**Methods** This pooled study of 10 NHL case-control studies participating in the InterLymph consortium, included 10,046 cases uniformly classified by subtype and 12,025 controls. Occupational histories were classified according to the ISCO 1968 classification, and occupations previously associated with increases in hematologic cancer risk were grouped into 26 *a priori* high risk occupational groups. Odds ratios, adjusting for centre, age and sex were determined for the *a priori* groups as well as all ISCO occupational codes including a minimum of 10 cases. Analyses were repeated by sex and for the subtypes diffuse large B-cell lymphoma (DLBCL; n = 3,061), follicular lymphoma (FL; n = 2,140), chronic lymphocytic leukemia/small lymphocytic lymphoma (CLL/SLL; n = 1,014) and T-cell lymphoma (n = 632).

**Results** DLBCL risk was elevated for textile workers (OR: 1.19; 95%CI: 1.01–1.41); field crop and vegetable farm workers (1.50; 1.15–1.97); charworkers, cleaners and related workers (1.27; 1.03–1.58) and hairdressers (1.47; 1.08–2.00). FL risk was elevated for unspecified labourers (1.28; 1.06–1.55) and spray painters (2.67; 1.36–5.25). CLL/SLL risk was elevated for women's hairdressers (2.69; 1.43–5.05); general farm workers (1.44; 1.13–1.84); pre-primary education teachers (2.00; 1.04–3.87) and printing pressmen (6.52; 2.79–15.2). T-cell lymphoma risk was elevated for textile workers (1.60; 1.18–2.17); wood workers (1.54; 1.04–2.27) and painters (1.80; 1.14–2.84). ORs differed significantly among subtypes for hairdressers, textile workers and printing pressmen.

**Conclusions** This pooled analysis supports a role for farming, textile, and hairdressing related exposures in the development of NHL. Occupations with potential exposure to solvents, metals, wood dust, infectious agents and mineral dust were also positively associated with NHL. For all four studied NHL subtypes occupational risk factors play a role, with notable differences in risk occupations across subtypes.

### 379 OCCUPATIONAL EXPOSURE TO TRICHLOROETHYLENE AND RISK OF NON-HODGKIN LYMPHOMA AND ITS MAJOR SUBTYPES: A POOLED INTERLYMPH ANALYSIS

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**Objectives** To test the association between occupational exposure to trichloroethylene (TCE) and risk of non Hodgkin lymphoma (NHL), we conducted a pooled analysis of four international case-control studies.

**Methods** Studies were selected which included state-of-the-art retrospective assessment of occupational exposure to TCE and histological information on lymphoma subtype. Overall, the pooled study population included 3788 NHL cases and 4279 controls. Summary indicators of exposure were harmonised across studies. We conducted unconditional logistic regression analysis to test the association between the harmonised TCE exposure estimates and NHL and its major subtypes, adjusting by age, gender, and study.

**Results** Among the total study population, risk of follicular lymphoma, but not NHL overall or other subtypes, increased by probability ( $p = 0.02$ ) and intensity level ( $p = 0.04$ ) of TCE exposure. When the analysis was restricted to subjects most likely exposed to TCE, risk of NHL overall ( $p = 0.009$ ), follicular lymphoma ( $p = 0.04$ ), and chronic lymphocytic leukaemia (CLL) ( $p = 0.01$ ) showed a linear increase by duration of exposure. No heterogeneity in NHL risk associated with high probability of exposure to TCE (all intensity levels combined) was detected.

**Conclusion** With due caution because of several limitations, our pooled analysis supports the hypothesis of an increased risk of NHL, and particularly of the follicular lymphoma and CLL subtypes, associated with occupational exposure to TCE.

### 380 MULTIPLE PESTICIDE EXPOSURES AND THE RISK OF MULTIPLE MYELOMA IN CANADIAN MEN

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**Objectives** Multiple myeloma (MM) has been linked to certain agricultural exposures, including pesticides, however the effects of exposure to multiple pesticides have not been explored. This analysis investigated the association between self-reported use of multiple pesticides and MM risk. Commonly used pesticide combinations and interactive effects were also assessed.

**Methods** A frequency matched population-based case-control study was conducted among men in 6 Canadian provinces between 1991 and 1994. Data from 342 MM cases and 1506 controls were analysed using logistic regression to calculate odds ratios (OR) and 95% confidence intervals (CI). Pesticides were grouped by type, chemical class and carcinogenicity. Carcinogenic probability values were created using evaluations from the

International Agency for Research on Cancer and U. S. Environmental Protection Agency. Regression models were adjusted for age, province of residence, use of proxy respondents, smoking, and selected medical history variables. Trends were examined using ordinal variables. Commonly used pesticide combinations were assessed for interaction on the additive scale using the interaction contrast ratio (ICR).

**Results** Multiple pesticide use was not associated with monotonically increasing odds of MM, although positive trends were observed for “probably” carcinogenic pesticides ( $p_{\text{trend}} = 0.01$ ), insecticides ( $p_{\text{trend}} = 0.07$ ), and fungicides ( $p_{\text{trend}} = 0.05$ ). Higher odds of MM were observed among men who reported using at least one carbamate pesticide (OR = 1.99, 95% CI: 1.19–3.33), one phenoxyherbicide (OR = 1.60, 95% CI: 1.11–2.30), 3 or more “probably” carcinogenic pesticides (OR = 2.14, 95% CI: 1.01–4.52), and 3 or more organochlorines (OR = 2.26, 95% CI: 1.07–4.78). Investigating commonly used pesticide combinations, revealed increased odds among men who used both chlordane and mecoprop (OR = 2.18, 95% CI: 1.12–4.27; ICR = 0.63).

**Conclusions** Focusing on multiple pesticides is important because this more accurately reflects how exposures occur in occupational settings. Although the overall pattern of results was complex, excess risks observed for certain pesticide types and chemical classes suggest these may be MM risk factors.

### 381 ENDOCRINE DISRUPTORS AND THE RISK OF LYMPHOMA IN THE EPILYMPH STUDY

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**Objectives** Some industrial chemicals and pesticides might have endocrine disrupting effects. While some pesticides and solvents have been associated with an increased risk of lymphoma, whether this would be the result of their potential endocrine disrupting effect has not been investigated as yet. We explored the role of occupational exposure to endocrine disruptors in lymphoma aetiology.

**Methods** The Epilymph study is a multicenter case-control study carried out in six European countries from 1998 to 2004. We evaluated 2,457 controls and 2,013 lymphoma cases and its subtypes. Information on occupational history was collected through face-to-face interviews. We applied a job-exposure matrix (JEM) for endocrine disrupting chemicals to assess occupational exposures (Brouwers *et al.* 2009). We evaluated exposure to ten chemical groups: polycyclic aromatic hydrocarbons, polychlorinated organic compounds, pesticides, phthalates, solvents, bisphenol-A, alkylphenolic compounds, brominated flame retardants, metals and a miscellaneous group.

**Results** Prevalence of ever occupationally exposed among controls ranged from 1% (bisphenol-A) to 48% (solvents). Risks for non-Hodgkin lymphoma (NHL) and chronic lymphocytic leukaemia (CLL) were increased with cumulative exposure to endocrine disruptors among men (OR = 1.20 CI95%:1.04–1.38 and 1.28 CI95%:1.01–1.61, respectively). However, none of the individual chemical groups evaluated was associated with NHL or follicular lymphoma risk. For other subtypes such as CLL, multiple myeloma, Hodgkin lymphoma and T-cell neoplasms risks were increased with several exposures, including metals