

**Conclusion** Pesticide exposure is considerable among the farmers. The occupational health conditions presented by the farmers can be linked with their pesticide investigation. Although this study has presented some risk factors associated with general health symptoms, further investigation should look into specific pesticide-health correlation.

#### 01A.5 EMERGENT ROLE OF EPIGENETIC BIOMARKERS OF PESTICIDES EXPOSURE: A CASE STUDY AMONG WOMEN OF CHILDBEARING AGE LIVING IN MEKNES (MOROCCO)

<sup>1,2</sup>Aziza Menouni\*, <sup>2</sup>Radu-Corneliu Duca, <sup>2</sup>Manosij Gosh, <sup>1</sup>Noura Zouine, <sup>1</sup>Ilham Lhalali, <sup>1</sup>Samir El Jaafari, <sup>2</sup>Lode Godderis. <sup>1</sup>Cluster of Competence 'Health and Environment', Moulay Ismail University, Meknes, Morocco; <sup>2</sup>Health and Environment Unit, Faculty of Medicine, KU Leuven, Leuven, Belgium

10.1136/OEM-2019-EPI.10

Pesticide exposure has been associated with acute and chronic adverse health effects. Current evidence supports that epigenetics may mediate these effects. DNA methylation (DNAm) is one of the broadly investigated epigenetic alteration. Therefore, to date, only limited human data is linking pesticide exposure to global DNAm alterations. Therefore, the aim of this study was to characterize pesticides exposure in women of reproductive age and investigate whether DNA methylation patterns were related to pesticides exposure level.

In a pilot study among 100 women from Meknes (Morocco), we measured 45 analytes (parent molecules and their metabolites) from three chemical families of pesticides: Organochlorines, organophosphates, pyrethroids, in urine and hair using HPLC/MS-MS and GC/MS. Commercial kits were used for quantification of 8-OHdG. We used LC/MS for measuring GSH. Pyrosequencing was used to measure Alu and LINE-1 methylation in DNA isolated from whole blood samples.

Pesticides are associated with genomic instability, which is proposed to be sensitive to nutritional intake and may also induce epigenetic changes. We evaluated the effect of life style and dietary intake on epigenetic instability in women. Our research prompts a re-thinking of the role of epigenetics on the understanding of the environmental exposure. We will then explore the role of epigenetic changes in the onset of cancer through the oxidative stress and DNA damage pathways.

#### 01A.6 THE CARCINOGENICITY OF PESTICIDES USED IN NEW ZEALAND

Andrea 't Mannetje\*. Centre For Public Health Research, Massey University, Wellington, New Zealand

10.1136/OEM-2019-EPI.11

**Introduction** Yearly over 3000 tonnes of pesticide active ingredients are applied in New Zealand agriculture. Since the 1980's, epidemiological studies have reported increased risks of lymphopoietic cancers in agricultural sectors with high pesticide use. Here we aim to estimate the number and total volume of currently used pesticides in New Zealand that are

known or suspected human carcinogens, in order to inform interventions.

**Methods** For each of the pesticide active ingredients most commonly used in New Zealand, the carcinogenicity classification of three regulatory agencies (The New Zealand Environmental Protection Authority [NZ-EPA], the US Environmental Protection Agency [US-EPA], and the European Chemicals Agency [EU]) were extracted, as well as the classification of the International Agency for Research on Cancer (IARC) Monograph Programme. Total tonnes of active ingredients that are known or suspected human carcinogens was calculated for each classification.

**Results** None of the pesticides used in New Zealand are classified as known human carcinogens by any of the three regulatory agencies or IARC. Annually New Zealand uses 148–756 tonnes of active pesticide ingredients that are classified as suspected human carcinogens by the three regulatory agencies. If also including the pesticides classified by IARC as possible or probable human carcinogens, the upper estimate doubles to 1475 tonnes, representing half of the total volume of pesticide active ingredients used in New Zealand agriculture. The percentage and volume of active ingredients classified as suspected carcinogens by the three regulatory agencies was highest for the fungicides (8%–60%; 72–540 tonnes), followed by herbicides (3%–10%; 60–200 tonnes), and insecticides (8%, 16 tonnes).

**Conclusions** Although no known human carcinogens are used as pesticides, New Zealand's high use of pesticides that are suspected carcinogens requires a greater awareness of the presence of potential carcinogens in the agricultural sector and the development of an intervention strategy to reduce cancer risk.

## Reproductive Effects

#### 01B.1 MODELING INFERTILITY IN A COHORT OF CANADIAN TRADESWOMEN

Nicola Cherry\*, Jean-Michel Galarneau. University of Alberta, Edmonton, Canada

10.1136/OEM-2019-EPI.12

**Introduction** With few female occupational cohorts, little is known about the contribution of work exposures to female infertility.

**Methods** A cohort of 888 tradeswomen across Canada was established (450 welders and 438 in the electrical trades) to examine effects on the fetus, with investigation of infertility a secondary objective. Women completed an extensive questionnaire at recruitment and follow-up questionnaires every six-months for up to 5 years. At each contact she was asked about attempts to get pregnant and barriers to conception. Fertility issues were identified both by self-report of failure to conceive for  $\geq 12$  months and as the likelihood of conceiving in any month at risk. Determinants of infertility were examined in a Cox regression with time dependent covariates. Employment factors examined in each month were paid work, trade work and cumulative months in trade. Maternal age, prior conceptions, smoking, use of alcohol and BMI were examined as confounders.

**Results** 96 periods of infertility  $\geq 12$  months were reported among 38 women from welding and 52 from electrical trades giving the risk of infertility for welders relative to

electricians of 0.71 (95%CI 0.48–1.06). Total person months at risk (excluding months with no sex, pregnancy, surgical sterility or menopause) were 12 696 for welders and 13 313 for electricians. Likelihood of conceiving in any month at risk was significantly reduced with use of better contraception, drinking >7 units of alcohol, increasing age, number of previous pregnancies and, for welders, smoking >10 cigarettes/day. No effect of either current or cumulative work in trade was evident having adjusted for confounding. HR for working as a welder was –0.07 95% CI –0.49–0.35.

**Conclusions** Female infertility presents challenges as an outcome in occupational epidemiology, but data can be structured to allow for time at risk. Analysis to date has demonstrated no important effect of exposure to welding.

### 01B.2 PARENTAL OCCUPATIONAL EXPOSURE TO EXTREMELY LOW-FREQUENCY MAGNETIC FIELDS AND THE RISK OF LEUKAEMIA IN THE OFFSPRING

Madar Talibov. *International Agency for Research on Cancer, Lyon, France*

10.1136/OEM-2019-EPI.13

**Background** Leukaemia is the most common cancer diagnosed in children worldwide, accounting for about one third of all paediatric malignancies in economically developed countries. Despite extensive research, the aetiology of this cancer remains largely unknown. Previous studies suggested that parental occupational exposure to extremely low-frequency magnetic fields (ELF-MF) may increase leukaemia risk in the offspring.

**Objective** We aimed to evaluate the association of parental occupational exposure to ELF-MF with the risk of acute lymphoblastic leukaemia (ALL) and acute myeloid leukaemia (AML) in their offspring.

**Methods** We pooled data from 11 case-control studies participating in the Childhood Leukaemia International Consortium (CLIC). The studies included 9723 childhood leukaemia cases and 17 099 controls. Data on parental job history and other characteristics of the study population were collected by questionnaires and interviews, except for the Finnish study where data was obtained from population registries and censuses. Parental occupational ELF-MF exposure was estimated by linking job histories to an independently developed international ELF-MF job-exposure matrix. Logistic regression models were used to estimate odds ratios (OR) and 95% confidence intervals (95% CI). We employed two analytical approaches to obtain summary risk estimates. First, we conducted pooled analyses of all studies combined. Second, we summarized ORs from individual studies in meta-analyses.

**Results** The summary OR estimates from pooled analyses for paternal ELF-MF exposure at conception were 1.04 (95% CI 0.95–1.13) for ALL and 1.06 (95% CI 0.87–1.29) for AML, at >0.2 microtesla ( $\mu$ T) compared to  $\leq$ 0.2  $\mu$ T. Corresponding estimates for maternal ELF-MF exposure during pregnancy, using again the 0.2  $\mu$ T cut-off, were 1.00 (95% CI 0.89–1.12) for ALL and 0.85 (95% CI 0.61–1.16) for AML. No trends with increasing exposure level were evident. Furthermore, no associations were observed in the meta-analyses.

**Conclusion** Our study did not find any associations between parental occupational ELF-MF exposure and childhood leukaemia.

### 01B.3 HYPERACTIVITY DISORDER IN CHILDREN WAS RELATED TO MATERNAL EMPLOYMENT STATUS DURING PREGNANCY AND POSTPARTUM DEPRESSIVE SYMPTOMS: A PROSPECTIVE COHORT STUDY

<sup>1,2</sup>Ping Shih\*, <sup>1,2</sup>Ching-Chun Huang, <sup>3</sup>Tung-liang Chiang, <sup>1,2</sup>Pau-Chung Chen, <sup>1,2,4</sup>Yue-Liang Leon Guo. <sup>1</sup>Department of Environmental and Occupational Medicine, National Taiwan University (NTU) College of Medicine and NTU Hospital, Taipei, Taiwan; <sup>2</sup>Institute of Occupational Medicine and Industrial Hygiene, College of Public Health, National Taiwan University, Taipei, Taiwan; <sup>3</sup>Institute of Health Policy and Management, College of Public Health, National Taiwan University, Taipei, Taiwan; <sup>4</sup>National Institute of Environmental Health Sciences, National Health Research Institutes, Zhunan, Taiwan

10.1136/OEM-2019-EPI.14

**Background** Attention-deficit/hyperactivity disorder (ADHD) is one of the most common neurobehavioral disorders globally. Although some investigations implied a relationship between ADHD and maternal psychosocial stress exposure during pregnancy, little is known about the effects of maternal occupational exposure and even postpartum mental health. This study aimed to investigate whether maternal employment status during pregnancy and postpartum depressive symptoms are related to offspring hyperactivity, one of the key early symptoms of children ADHD.

**Methods** Taiwan Birth Cohort Study recruited representative mother-infant pairs, as a result of approximately 12% of all deliveries in 2005 using multistage stratified sampling. Employment status with or without job stress during pregnancy and postpartum depressive symptoms were inquired when the child was six months of age by face-to-face interview. Ever having hyperactivity syndrome as evaluated by physicians, psychologists, or special educators was inquired when the child was eight years of age. Factors of hyperactivity, including maternal employment, job stress, and postpartum depression were studied by adjusted odds ratios (aORs) and 95% confidence interval (CI) using logistic regression, adjusting for gender, urban/rural residence, birth season and household income.

**Results** 18 215 mother-infant pairs were included in the final analysis, where 421 (2.3%) of children had been diagnosed as having hyperactivity before 8 years of age. Comparing to mothers employed and without job stress during pregnancy, the aOR (95% CI) of child hyperactivity was 1.47 (95%CI: 1.12, 1.94) for mothers with job stress and 1.43 (95%CI: 1.12, 1.84) for mothers with no employment during pregnancy, respectively. Besides, children were 1.36 (95% CI: 1.07, 1.73) times more likely to receive an ADHD diagnosis if their mother experienced postpartum depressive symptoms.

**Conclusions** In this prospective birth cohort study, mothers' employment status, job stress during pregnancy, and postpartum depressive symptoms were risk factors for the occurrence of hyperactivity in their children.

### 01B.4 HEALTH EFFECTS OF PRENATAL OCCUPATIONAL NOISE EXPOSURE: A SYSTEMATIC REVIEW

Zara Ann Stokholm\*, Inge Brosbøl Iversen, Henrik Kolstad. *Department of Occupational Medicine, Aarhus University Hospital, Aarhus N, Denmark*

10.1136/OEM-2019-EPI.15

Current legislation and threshold limits for occupational noise exposure may not sufficiently account for higher vulnerability of the foetus. We conducted a systematic literature review and