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Background: Existing studies on the health effects of e-cigarettes focused on e-cigarette users themselves. To study the corresponding effects on passive vapers, it is crucial to quantify e-cigarette chemicals deposited in their airways.

Objective: This study proposed an innovative approach to estimate the deposited dose of e-cigarette chemicals in the passive vapers’ airways. The effect of the distance between active and passive vapers on the deposited dose was also examined.

Methods: The chemical constituent analysis was conducted to detect Nicotine and flavoring agents in e-cigarette aerosol. The Mobile Aerosol Lung Deposition Apparatus (MALDA) was employed to conduct aerosol respiratory deposition experiments in real-life settings to generate real-time data.

Results: For e-cigarette aerosol in the ultrafine particle regime, the deposited doses in the alveolar region were on average 3.2 times higher than those in the head-to-TB airways, and the deposited dose in the passive vaper’s airways increased when being closer to the active vaper.

Significance: With prolonged exposure and close proximity to active vapers, passive vapers may be at risk for potential health effects of harmful e-cigarette chemicals. The methodology developed in this study has laid the groundwork for future research on exposure assessment and health risk analysis for passive vaping.

Authors: Wei-Chung Su, Ying-Hsuan Lin, Su-Wei Wong, Jin Y Chen, Jinho Lee, Anne Buu
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Background: Microplastics (MP) are classified based on primary or secondary sources, are widely distributed in the environment and exert significant effects on aquatic life forms; however, evidence regarding the ecotoxicological effects of microplastics on aquatic organisms is still limited. This research aims at filling a knowledge gap regarding generation sources, distribution, physicochemical properties, and biological behavior of microplastics (MP) in aquatic environments and their interaction with aquatic organisms. The literature indicates that concentrations of MPs observed in such environments are higher than the threshold for safe concentration (6650 buoyant particles/m³). MPs having large specific surface area, low polarity, and hydrophobic properties have been shown to absorb dichlorodiphenyltrichloroethane (DDT), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbon (PAHs), bisphenol A (BPA), perfluorooalkyl substances (PFAS), antibiotics, and heavy metals. MPs adsorb large amounts of toxic organic chemicals (18,700 ng/g PCBs; 24,000 ng/g PAHs) and heavy metals (0.2-1.430 μg/g Cr; 0.0029-930 μg/g Cd; 0.35-2.89 μg/g Pb; 0.26-698,000 μg/g Ptl), MPs originating from polystyrene (PS), polypropylene (PP), and polyvinylchloride (PVC) show greater toxicity toward aquatic organisms, with effects on the immune system, reproductive system, nervous system, and endocrine system.

Authors: Huu Cong Vo, Minh Hen Pham

Introduction: As the amount of time people spend indoors increases globally, exposure to indoor air pollutants has become an important public health concern.

Methods: Eleven databases were systematically searched on the February 1, 2019 and again on the February 2, 2020. Articles were limited to those published since 1990. Reference lists were independently screened by three reviewers and authors were contacted to identify relevant articles. Backwards and forward citation chasing was used to identify further studies. Data were extracted from included studies meeting our eligibility criteria by three
those contributing to PM2.5 mass concentrations (secondary inorganic aerosol); thus, OB metrics may better indicate harmful components and sources on health than the bulk PM2.5 mass, reinforcing that OB estimates can complement the existing PM2.5 data in future national-level epidemiological studies.

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**OCCUPATIONAL**

Risk of asbestosis, mesothelioma, other lung disease or death among motor vehicle mechanics: a 45-year Danish cohort study

2021-07-08

Introduction: The risk of asbestosis, malignant mesothelioma and lung cancer among motor vehicle mechanics is of concern because of potential exposure to chrysotile asbestos during brake, clutch and gasket repair and maintenance. Asbestos has also been used in insulation and exhaust systems.

Methods: We examined the long-term risk of incident mesothelioma, lung cancer, asbestosis and other lung diseases and mortality due to mesothelioma, lung cancer, asbestosis and other lung diseases in a nationwide cohort of all men registered as motor vehicle mechanics since 1970 in Denmark. This was compared with the corresponding risk in a cohort of male workers matched 10:1 by age and calendar year, with similar socioeconomic status (instrument makers, dairymen, upholsterers, glaziers, butchers, bakers, drivers, farmers and workers in the food industry, trade or public services).

Results: Our study included 138 559 motor vehicle mechanics [median age 24 years; median follow-up 20 years [maximum 45 years]] and 1 385 590 comparison workers [median age 25 years; median follow-up 19 years [maximum 45 years]]. Compared with other workers, vehicle mechanics had a lower risk of morbidity due to mesothelioma/pleural cancer [n=47 cases] [age-adjusted and calendar-year-adjusted HR=0.74 [95% CI 0.55 to 0.99]], a slightly increased risk of lung cancer [HR=1.09 [95% CI 1.03 to 1.14]], increased risk of asbestosis [HR=1.50 [95% CI 1.10 to 2.03]] and a chronic obstructive pulmonary disease risk close to unity [HR=1.02 [95% CI 0.99 to 1.05]].
Cancers can be triggered by occupational causes.

Cytostatic drugs and risk of genotoxicity in health workers. A literature review

Objective: To analyse the genotoxic risk of cytostatic drugs in health professionals after occupational exposure.

Method: Literature was searched for the databases PubMed, Lilacs, The Cochrane Library and Scopus with free and controlled language (MeSH terms) using boolean operators AND and OR. The research was limited to articles published between 2005-2016.

Results: 11 articles were selected depending on their relevancy to this review’s aim. Nine of the 11 articles proved the existence of damage to genetic material (DNA) of health workers, who were exposed to cytostatics. Furthermore, current security practices do not eliminate the chance of exposure completely. Therefore, the creation of new clinical trials is required.

Conclusions: Handling cytostatic drugs can cause a genotoxic risk to health workers who are exposed to these substances. This exposure may cause damage on the workers’ DNA. There are not enough data to prove a cause-effect relationship between the genotoxic risk and adverse reactions on individuals. Health education will be the main way to raise the awareness and prevention this problem.

Authors: Macarena Mateo González-Román, Patricia Paloma Hidalgo García, David Peña Otero


Infantile neuroblastoma and maternal occupational exposure to medical agents

Background: Healthcare workers are often exposed to hazardous agents and are at risk for adverse health consequences that affect not only themselves but also their infants. This study aimed to examine whether such occupational exposure increased the risk of childhood cancer in offspring.

Methods: We used the dataset of the Japan Environment and Children’s Study, a nationwide birth cohort involving over 100,000 mother-child pairs. Information was obtained via successive questionnaires that were completed until the child turned 1 year of age. The parents were asked whether they occupationally handled medical agents during pregnancy.

Results: A total of 26 infants developed neoplasms: neuroblastoma, leukemia, and brain tumor. The incidence of neuroblastoma was significantly higher in infants whose mothers were exposed to radiation [3/2142: 140.1 per 100,000 population] than in those who were not [12/90,384: 13.3 per 100,000 population]. Multivariable regression analyses revealed a close association between maternal irradiation and the development of neuroblastoma [adjusted incident rate ratio: 10.68 [95% confidence interval: 2.98:38.27]].

Conclusions: The present
The relationship between maternal perfluoroalkylated substances exposure and low birth weight of offspring: a systematic review and meta-analysis

2021-07-09

Some studies have shown that maternal perfluoroalkylated substances (PFAS) exposure may be associated with low birth weight (LBW) of offspring. We conducted a meta-analysis to assess the association between maternal PFASs exposure and LBW in offspring. The researchers searched PubMed, Science Direct, Scopus, Google Scholar, Web of Science, and Embase to find all the articles before October 2020. The Newcastle-Ottawa Scale was used to evaluate the quality of the studies. Finally, six articles were included for meta-analysis. Our meta-analysis showed no significant correlation between maternal perfluoroalkylated acid (PPFA) exposure and LBW of offspring; odds ratio (OR) = 0.90, 95% confidence interval (95% CI) = 0.80-1.01, with low heterogeneity (I² = 18.4%, P = 0.289). There was a significant positive correlation between maternal perfluorooctane sulfonate (PFOS) exposure and LBW of offspring; OR = 1.32, 95% CI = 1.09-1.55) with no heterogeneity (I² = 0.00%, P = 0.570). The grouping analysis of PFOS showed was a significant positive correlation in American (OR = 1.44, 95% CI = 1.15-1.72). This study provided a systematic review and meta-analysis evidence for the relationship between maternal PFASs exposure and LBW of offspring through a small number of studies. Researchers should conduct further studies between different regions.

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Is cadmium a risk factor for breast cancer - results from a nested case-control study using data from the Malmö Diet and Cancer Study

2021-07-08

Background: Some studies have shown that cadmium is associated with breast cancer risk. One hypothesis is that cadmium has estrogen-like properties. This case-control study investigates the association between breast cancer risk and blood cadmium levels.

Methods: All breast cancers in the Malmö Diet and Cancer cohort were identified through linkage to the Swedish Cancer Registry, baseline (1991-1996) through 2014. Two controls per case were selected from the same cohort. Blood cadmium (BCd) was analyzed at baseline. Associations were analyzed using logistic regression.

Results: Mean BCd was 0.51 μg/L among 1274 cases and 0.46 among 2572 controls. There was an overall increased risk of breast cancer [odds ratio (OR)=1.18 (95%% confidence interval [CI]) 1.05 - 1.36] per μg/L of BCd. An increased risk was, however, only found at high BCd: OR=1.34 (95% CI 1.05-1.73) for BCd >1.20 μg/L. The group with the highest BCd was mainly smokers. A spline indicated that at BCd <1.0 μg/L, the OR was not increased. The association with BCd was stronger in current smokers and at body mass index above 25, while no modification due to receptor status was found.

Conclusions: The results indicated increased risk of breast cancer only for high Cd exposure, which occurred mainly among smokers. This made it difficult to disentangle the effects of smoking and Cd, despite inclusion of smoking habits in the models.

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Impact: This study provides support for reducing cadmium exposure through smoking cessation and dietary choice. On the population level preventive measures against cadmium pollution are warranted.
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