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SCIENTIFIC PROGRAM
ABSTRACTS BY SESSION

Title: Risk of childhood leukemia and exposure to outdoor air pollution: Updated review and dose-response meta-analysis

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Bio: Professor Vinceti is Associate Professor of Epidemiology and Public Health. The main research fields are human health effects of environmental exposure to selenium, heavy metals, pesticides and magnetic fields, with focus on environmental risk factors of amyotrophic lateral sclerosis, childhood leukemia and birth defects, nutritional epidemiology and health risk assessment of municipal solid waste incinerators.

Background: Leukemia is the most frequent malignant disease of childhood. Most epidemiologic studies have suggested that exposure to traffic pollutants may increase the risk of childhood leukemia. We updated our previous review and meta-analysis as some recent studies have now available, and we performed a dose-response meta-analysis using a traffic density estimator.

Methods: We performed a systematic PubMed search in July 2016, including as MeSH terms 'childhood leukemia', 'traffic' and 'benzene'. We extracted the following data: study estimates, type of exposure assessment (traffic density, generally coded as number of vehicles per day, distance and/or length of major roads near subject's address; benzene exposure) and leukemia subtype (ALL, acute lymphoblastic leukemia; AML, acute myeloid leukemia). We used the highest versus the lowest category estimates for meta-analysis of the effect of traffic density and benzene exposure on disease risk. For dose-response meta-analysis the number of vehicles per day was used as a continuous estimate of traffic exposure.

Results: Summary ORs associated with traffic density were 1.03 (95% CI 0.96-1.12) for all leukemia, 1.03 (1.00 to 1.06 for ALL and 1.02 (0.81 to 1.06) for AML. For benzene, summary ORs were 1.29 (0.98 to 1.70) for all leukemia, 1.04 (0.87 to 1.24) for ALL and 1.75 (1.20 to 2.56) for AML. Sensitivity analysis removing alternatively one study from each summary estimate did not alter the results substantially. Dose-response meta-analysis indicated an approximately linear association between numbers of vehicles per day and disease risk, with ORs of 1.12 (0.75 to 1.66) and 1.39 (0.63 to 3.06) for 5,000 and 10,000 vehicles increase, respectively.

Conclusions: Our results confirmed previous findings about an excess risk of childhood leukemia in areas with high traffic density, especially for the ALL subtype. When comparing specific pollutants, benzene increased AML risk.