

S01.04.18. Fluoride Levels in Urine and Tap Water in Canada: Data from the Canadian Health Measures Survey 2012-2015 and Interpretation in a Risk-Based Context

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Abstract: Fluoride is recognized as beneficial to dental health because of its ability to prevent tooth decay. However, excessive fluoride intake may cause dental fluorosis, and at much higher levels skeletal fluorosis and other adverse health effects. For many years, water fluoridation has been introduced in various Canadian communities and around the world as a public health measure to prevent dental decay. Besides tap water, Canadians are exposed to fluoride through food, beverages, and fluoridated dental products. In order to track fluoride exposure in Canada, fluoride levels in urine and tap water of Canadians have been monitored in the Canadian Health Measures Survey (CHMS) in 2012-2015. Using CHMS data and municipal fluoridation information, this study examined fluoride levels in urine and tap water of the Canadian population and potential associations between urinary fluoride levels and various exposure factors. It also aimed at interpreting the urinary fluoride levels in a risk-based context using biomonitoring equivalent (BE) values. Analysis showed that urinary fluoride levels varied by age and sex. Children aged 3-5 years had the highest urinary fluoride levels while the 11-19-year-old had the lowest concentrations. Females had higher urinary fluoride levels than males. The vast majority of Canadians had tap water fluoride levels lower than Health Canada's maximum acceptable concentration. The results also showed that the majority of the population had urinary fluoride levels below the BE values, suggesting that exposure levels in Canadians are generally below the recommended adequate intake levels for fluoride for the prevention of dental caries. This study presents the first nationally representative dataset on fluoride, which will be helpful to inform future risk assessment and management of this chemical in Canada.

S02.01E. Fluoride Exposure and Health Outcomes in North America

S02.01.21. Community Water Fluoridation and Urinary Fluoride Concentrations in a National Sample of Pregnant Women in Canada

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Abstract: Background: Fluoride exposure in pregnant women who live in regions with and without community water fluoridation has not been established. Objective: To measure urinary fluoride levels during pregnancy using urinary creatinine and specific gravity (SG) as dilution correction standards. Methods: We measured maternal urinary fluoride (MUF) concentrations in spot samples collected in each trimester of pregnancy from 1566 pregnant women living in ten Canadian cities and enrolled in the "Maternal-Infant Research on Environmental Chemicals" cohort. We calculated intraclass correlation coefficients (ICCs) to assess variability in MUF concentrations across pregnancy. We estimated associations between MUF levels, tea consumption, and water fluoride concentrations as measured by water treatment plants using regression analyses. Results: Creatinine-adjusted MUF values (M ± SD; mg/L) were almost two-times higher for pregnant women living in fluoridated regions (0.86 ± 0.34) compared with non-fluoridated regions (0.46 ± 0.50; p<0.001). MUF values had modest reproducibility (ICC = 0.41) and tended to increase over the course of pregnancy. Creatinine-adjusted MUF was positively associated with municipal water fluoride level (B=0.52, 95% CI: 0.46, 0.57), accounting for 24% of the variance after controlling for covariates. Higher MUF concentration correlated with number of cups of black (r = 0.31 to 0.32, p<0.005), but not green tea (r = 0.04 to 0.06). Urinary creatinine and SG correction methods were highly correlated (r = 0.91) and interchangeable in models examining predictors of MUF. Conclusion: Community water fluoridation is a major source of fluoride exposure for pregnant women living in Canada. Urinary dilution correction with creatinine and SG are valid and interchangeable methods for pregnant women.

S02.01.22. Fluoride Exposure during Fetal Development and Childhood IQ: The MIREC Study

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Abstract: Background: The potential neurotoxicity of early life exposure to fluoride, which has sparked controversy about community water fluoridation, is poorly understood. Objective: To test the association between fluoride exposure during fetal development and childhood IQ in a Canadian sample of 510 mother-child pairs enrolled in the Maternal-Infant Research on Environmental Chemicals (MIREC) birth cohort; 38% received "optimal" levels of community fluoridated water. Methods: We measured three maternal urinary fluoride (MUF) concentrations during pregnancy, averaged them and adjusted them for specific gravity. Children's cognitive abilities were assessed using the Wechsler Primary and Preschool Scale of Intelligence-III at 3-4 years of age. We used multiple linear regression analyses to examine covariate-adjusted associations between MUF and IQ, and to test for interaction with child's sex. We retained the following covariates based on theoretical and statistical relevance: city, quality of child's home environment, maternal education, and race. Results: Average MUF concentrations for all women were 0.51 mg/L (+/-0.36; range=0.06-2.44); MUF concentrations were lower in women supplied with non-fluoridated water (0.40 mg/L +/-0.27) than women supplied with fluoridated water (0.69 mg/L +/-0.41). MUF levels were inversely associated with Full Scale IQ in males (B=-4.51, 95% CI: -8.39, -0.63, p=0.02), but not in females (B=2.43, p=0.33). Among males, higher MUF levels were associated with a significantly larger reduction in Performance IQ (B=-4.63, p=0.04) than Verbal IQ (B=-2.85, p=0.14). Sensitivity analyses using MUF adjusted for creatinine and controlling for other known neurotoxins (i.e., lead, mercury and arsenic) did not substantially change the results. Conclusion: An increase of 1mg/L of MUF during prenatal development was associated with a decrease of Full Scale IQ by 4.5 points in young boys.

S02.01.23. Prenatal Fluoride Exposure and Cognitive Outcomes in Children at 4 and 6-12 Years of Age in Mexico

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Abstract: Background: Some evidence suggests that fluoride may be neurotoxic to children. Few of the epidemiologic studies have been longitudinal, had individual measures of fluoride exposure, addressed the impact of prenatal exposures or involved more than 100 participants. Objective: To discuss our recently published as well as key unpublished results of the association of prenatal exposure to fluoride with offspring measures of intelligence. Methods: We studied participants from the Early Life Exposures in Mexico to Environmental Toxicants (ELEMENT) project. An ion-selective electrode technique was used to measure fluoride in archived urine samples taken from mothers during pregnancy and from their children when 6-12 years of age, adjusted for urinary creatinine and specific gravity, respectively. Child intelligence was measured by the General Cognitive Index (GCI) of the McCarthy Scales of Children's Abilities at age 4 and full scale intelligence quotient (IQ) from the Wechsler Abbreviated Scale of Intelligence (WASI) at age 6-12 years. Results: We had complete data on 299 mother-child pairs, of whom 287 and 211 had data for the GCI and IQ analyses, respectively. Mean (SD) values for urinary fluoride in all of the mothers (n=299) and children with available urine samples (n=211) were 0.90 (0.35) mg/L and 0.82 (0.38) mg/L, respectively. In multivariate models, an increase in maternal urine fluoride of 0.5mg/L (approximately the IQR) predicted 3.15 (95% CI -5.42, -0.87) and 2.50 (95% CI -4.12, -0.59) lower offspring GCI and IQ scores, respectively. Trimester-specific results suggest that exposure during the 1st trimester may have the strongest negative effect. Conclusion: In this study, prenatal fluoride exposure, in the range of exposures reported for other general population samples of pregnant women and non-pregnant adults, was associated with lower scores on tests of cognitive function in the offspring at age 4 and 6-12 years.

S02.01.24. Fluoride Exposure and Thyroid Function among Iodine Deficient Adults in Canada

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Abstract: Background: Fluoride exposure has the potential to disrupt thyroid functioning, though adequate iodine intake may mitigate this effect. This study is the first population-based study to examine the impact of chronic low-level fluoride exposure on thyroid function, while considering iodine status. Objective: This study used weighted population-based data from Cycle 3 (2012-2013) of the Canadian Health Measures Survey (CMHS), a cross-sectional survey designed to collect health and wellness data and biological specimens on Canadians. Methods: The weighted sample represented 7,543,966 adults aged 18-79 who were not taking any thyroid-related medication. Urinary fluoride concentrations were measured in spot samples using an ion selective electrode and adjusted for specific gravity (UFSG) and creatinine (UFCR). Serum TSH levels provided a measure of thyroid function. Multivariable regression analyses examined the relationship between adjusted levels of urinary fluoride and TSH, controlling for covariates. We tested whether TSH levels were more strongly related to urinary fluoride levels in adults who were moderately-to-severely iodine deficient than in adults who were iodine sufficient, according to World Health Organization reference standards Results: The mean (SD) age of the sample was 46.6 (15.8) years and approximately 17.8% fell in the moderately-to-severely iodine deficient range. Median UFSG and UFCR concentrations were 0.74 mg/L and 0.46 mg/g, respectively. Among iodine deficient adults, a 1 mg/L increase in UFSG was associated with a 0.36 mIU/L increase in TSH [95% CI: -0.03, 0.75; $p = 0.03$], and a 1 mg/g increase in UFCR was associated with a 0.61 mIU/L increase in TSH [95% CI: 0.22, 0.99; $p < 0.01$]. Conclusion: Adults living in Canada who have moderate-to-severe iodine deficiencies and higher levels of urinary fluoride may be at an increased risk for underactive thyroid gland activity.

S02.01.25. Fluoride Exposure and Dental Enamel Fluorosis

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Abstract: At appropriate levels, fluoride has been established as an effective agent in the prevention of dental caries. However, a worldwide increasing prevalence of dental enamel fluorosis, a condition that results from excessive intake of fluoride during tooth development, has raised questions regarding a possible excessive intake of and exposure to fluoride in children. This presentation will review selected studies on the prevalence of dental fluorosis in Mexico. Results from studies conducted in naturally fluoridated areas where water content is above optimal, as well as studies conducted in areas where water has negligible, unknown or optimal amounts of fluoride and fluoridated salt is distributed, will be presented. In addition, results from studies on fluoride intake and exposure in Mexico will be discussed. Findings from a recent epidemiological study that assessed dental enamel fluorosis clinically and through the use of imaging technology as well as fluoride intake and exposure in Mexican children will be presented. Finally, trends on the prevalence of enamel fluorosis in Mexico over the last four decades (before and after the introduction of salt fluoridation) will be discussed. The presentation and discussion of this evidence will be useful to inform public policy aiming at optimizing the beneficial effects of fluoride while minimizing its detrimental effects.

S02.02G. The Fluoridation Decision: Considering the Evidence for Benefits, Possible Risks as Well as Ethical World Views

S02.02.31. Ethical World Views and Fluoridation Policy

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Abstract: A utilitarian world view favors a policy where the accumulated utility from benefits outweighs the disutility of any adverse side effects. A Libertarian Duty Ethics world view opposes any policy that threatens any individual's autonomy. The Libertarian perspective may become more salient if possible adverse effects were found to convey higher risks to vulnerable persons with certain genes. What policies might address both world views?

S02.02.32. Evidence About the Benefits of Fluoridation: Caries Prevention Benefits

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Abstract: At appropriate levels, fluoride has been well established as a safe and effective agent in the prevention of dental caries. On the other hand, when individuals are exposed to excessive amounts of fluoride, negative side effects are seen. Despite advances in the reduction of oral diseases, dental caries remains common among both children and adults worldwide, especially among underserved populations in high, middle, and low income countries. Dental caries can negatively affect individuals' overall health and quality of life, and often results in reduced productivity. In addition, its traditional treatment is extremely costly, in both high and low-income countries. While death as a direct result of dental caries remains rare, its presence does result in years lived with disability. This presentation will review the evidence supporting fluoride's role in lowering the prevalence and incidence of dental caries and the preservation of functional dentition as well as good nutrition in late adulthood and how this results in increasing disability-adjusted life years (DALYs). Findings from selected studies on global and national incidence, prevalence, and years lived with disability for dental caries will be reviewed. Trends on the prevalence of dental caries in different segments of the population as well as the number of people with untreated disease will also be presented. The detailed analysis of this evidence will provide background information for an informed discussion on the benefits of fluoridation and any diminution of DALYs from potential adverse side effects.

S02.02.33. Neurotoxic Effects of Fluoride Exposures in North America

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Abstract: Fluoride is neurotoxic at exposure levels that exceed maximum intake levels, but less is known about the neurotoxicity of fluoride at 'optimal' levels. Concerns about community fluoridation schemes and adverse health effects are steadily mounting, particularly for vulnerable populations, such as the fetus and young children. There is also concern that the prevalence and severity of dental enamel fluorosis have increased over the past three decades among youth in Canada and the United States. These findings suggest that a fraction of the population experiences excessive intake of fluoride in early development. In 2006, the National Research Council concluded that developmental neurotoxicity may be associated with fluoride exposures given the consistency of available evidence from animal and human studies. However, it has been a public health challenge to reach scientific consensus about what constitutes a safe level of fluoride. This is partly due to the lack of rigorous scientific investigations examining fluoride exposure at critical periods in development and using sensitive endpoints and effective biomarkers of exposure. This presentation reviews recent epidemiologic studies that help to fill in the gap related to detrimental health consequences related to water or salt fluoridation programs. Findings reported in a Canadian and Mexican birth cohort are consistent in showing that higher level of urinary fluoride in pregnancy is associated with lower IQ in offspring. Other adverse effects of fluoride exposure include increased risk of attention deficits following prenatal exposure to fluoride and increased risk of thyroid disruption among iodine-deficient adults. This growing body of evidence linking chronic fluoride exposure to serious health risks beyond fluorosis adds critical new information to the evidence base for informing public health policy.

S02.02.34. Possible Benefits and Adverse Effects of Fluoridation in England, 2018 Public Health England Report

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Abstract: The protective effect of community water fluoridation (CWF) on caries has been well demonstrated and relationships with adverse health outcomes have also been alleged. We have recently completed a study of the association between concentrations of fluoride in public water supplies (PWS) and dental caries indicators, as well as several adverse non-dental health-outcomes in England, using recent available routine surveillance data. The methods and results are presented in more detail in other talks at this meeting. The benefits in terms on reduction of caries from CWF are clearly supported by our results, and there was strong interaction with socio-economic status. For example, comparing children in areas with a fluoridation scheme and >0.7mg/l fluoride to low areas with <0.2mg/l fluoride, there are 17% less with caries in the least deprived areas, rising to 28% in the most deprived areas. For non-dental outcomes, we found some associations between fluoride and fractures (adverse) and bladder cancer (protective). However in both cases the pattern of results, especially the lack of a dose response pattern across exposure, suggested a non-causal association. It was concluded that these findings were consistent with water fluoridation being an effective and safe public health measure, in areas with fluoride concentration up to 1 mg/l, to reduce dental caries and reduce dental health inequalities. In reaching this conclusion, the study team balanced both the magnitude of the dental and non-dental effects, and the strength of evidence in terms of internal coherence and consistency with other evidence. Most studies showing adverse effects are at much higher fluoride concentrations and extrapolation to lower concentrations is very uncertain. Some endpoints such as endocrine (thyroid) and neurological (IQ) for exposure up to 1 mg/l could not be addressed in this study, and still need addressing.

P01. Risk Assessment and Policy 1

P01.2850. The Consumption of Fluoridated Water during the Development of the Rat Modifies the Emotional State

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Abstract: Background/Aim: Access to safe drinking water is essential to health, a basic human right and a component of effective policy for health protection. Fluoride (F) is present ubiquitously in the environment, including surface and groundwater. This compound has therapeutic properties to prevent tooth decay at low concentrations, but some research has demonstrated its toxic effects at several concentrations. Clinical and experimental studies have reported that F induces changes in cerebral morphology and biochemistry that affect emotional processes, such as anxiety and depression. The World Health Organization recommends a F concentration of 1.5 mg/L; in Mexico, the legislation establishes 0.7 mg/L as the maximum limit for drinking water. The aim of this study was to evaluate the effects of F on behavior through the forced swim test (FST) in rats exposed to F in drinking water. Method: Male Wistar rats were exposed orally to F in drinking water at concentrations of 0.7, 1.5, 5 and 10 mg/L since gestation until 90 days after parturition. Two control (C1 and C2) groups were performed, C1 with distilled water and C2 with distilled water and fluoxetine at 1 mg/kg during the last 10 days. After exposure, FST and open field test were carried out to determine the depressive-like behavior and to exclude locomotor impairment, respectively. Results: F exposure at these doses changes the variables evaluated in FST, e.g. immobility, but do not alter locomotive capacities. Fluoxetine administration in C2 group decreased immobility in comparison to C1 group and without changes on locomotor activities. Conclusions: Results shows that exposure to F during development can yield to a depressive-like behavior in rats, suggesting that high intake of F must be prevented to avoid harmful effects at adulthood.

P02.0360. Development of Guide Book on Outpatient Treatment and Physical Checkup for Accident Preparedness Substances

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Abstract: INTRODUCTION On September 27, 2012, Hydrogen fluoride leakage accident occurred in Hube Global Co.,Ltd. And such massive chemical accidents involve environmental pollution and severe impact on human bodies. The accidents also may cause large number of victims. Therefore, it is necessary to develop and distribute a guide book on treating outpatient and physical checkup in case of chemical accidents. METHODS For the guide book, certain substances against accidents are selected based on data from Occupational Safety & Health Research Institute and American Center for Disease Control and Prevention, The items correspond to South Korea's status and the related specialists can immediately refer to the guide book on fields or medical institutes in case of chemical accidents. RESULTS The guide book includes information on following items 1) Guide on physical checkup and outpatient treatment for each substances, 2) Guide on first aid, 3) Introductions for physical checkup and outpatient treatment, 4) Substance information sheet for patients, 5) Follow up sheet for patients. CONCLUSIONS This guide book's advantage is that it can be used immediately by related specialist on fields or medical institutes during the chemical accident. In addition, the guide book explains on how to make questionnaire for exposure assessment during the survey on health impact and on how to collect and store biological monitoring sample. Such information will be very useful when dealing with chemical accidents. ACKNOWLEDGEMENT This research was supported by the Environmental Health Center for Hazardous Gas Exposure. REFERENCES Agency for Toxic Substances and disease Registry (ATSDR), 2003. Toxicological profile for Fluorides, Hydrogen Fluoride, and Fluorine (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

P02.3141. Association between Fluoride Concentration in Public Water Supplies and Beneficial and Adverse Health Outcomes in England: An Ecological Study

Tony Fletcher

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Abstract: The protective effect of community water fluoridation (CWF) on caries is established, but secular changes may modify its impact. Relationships with adverse health outcomes have also been alleged. We aimed to determine the association between concentrations of fluoride in public water supplies (PWS) and dental caries indicators, and certain adverse health-outcomes to monitor the health effects of CWF in England. We estimated exposure to CWF and PWS fluoride concentrations from national PWS monitoring data, using Geographic Information Systems and water supply boundaries. We categorised mean period exposure into <0.1, 0.1-<0.2, 0.2-<0.4, 0.4-<0.7, and ≥ 0.7 mg/l. We obtained area-level health outcome and confounder data from routine data sources. We used multivariable regression to determine the association between fluoride and health outcomes. The association between fluoride level and caries prevalence/severity varied by quintile of socioeconomic status (SES) ($p < 0.001$ for interaction). Odds of caries, and of severe caries in five-year-olds, fell with increasing category of fluoride concentration in each quintile of SES ($p < 0.001$ to $p = 0.003$). There was a negative trend between increasing fluoride concentration and dental extractions ($p < 0.001$). There were sporadic positive associations ($p < 0.05$) between varying fluoride concentrations and Down's syndrome and kidney stones, but without evidence for a trend or threshold. There was a negative association with bladder cancer at the highest fluoride concentration. The association with hip fracture varied in direction by age ($p < 0.001$), with a small positive association (RRs 1.03-1.05, $p = 0.08$ or below) in adults aged 80 years+ at each fluoride concentration relative to <0.1mg/l. There was no strong evidence of an association with osteosarcoma. Exposure to fluoride in PWS appears highly protective of caries and caries extractions. Our findings did not provide clear evidence of an association with the adverse health outcomes.

P02.3650. Fluoride Levels in Mexican Foods and Beverages

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Abstract: **INTRODUCTION** The sources of fluoride exposure for the Mexicans are foods, beverages, fluoridated salt and naturally fluoridated water. The main objective of this study was to estimate the concentration of fluoride in foods and beverages most frequently consumed in Mexico; in addition, their fluoride content was compared to data available from the United States (US) and the United Kingdom (UK). **METHODOLOGY** From the Health and Nutrition Survey 2012 we identified 182 foods and beverages and purchased in the biggest supermarkets chains and local markets in Mexico City. Samples were analyzed for fluoride content at least in duplicate to account for variability at the Oral Health Research Institute, Indiana University School of Dentistry, using a modification of the hexamethyldisiloxane microdiffusion method. **RESULTS** We tested 166 foods and 16 beverages, classified into 14 food groups to compare with their US and UK counterparts, and finding among them a very wide range of values. Foods with the lowest and highest fluoride content were vegetable shortening (0.24µg/100g) and fried/baked pork rinds (1465.40µg/100g), respectively. The food groups with lowest and highest content were eggs (2.32µg/100g) and seafood (371.29µg/100g), respectively. When estimating the amount of fluoride ingested per portion size, the lowest values corresponded to eggs and the highest to fast food. When comparing between countries, meats and sausages, cereals, fast food, sweets and cakes, fruits, dairy products, legumes and seafood from Mexico, presented higher fluoride contents than similar foods from the US or the UK. Drinks and eggs from the US exhibited the highest fluoride contents, while this was the case for pasta, soups and vegetables from the UK. **CONCLUSION** The majority of tested Mexican foods and beverages contained higher fluoride contents than their US and UK counterparts. The Mexican data generated in this study will be useful to facilitate the monitoring of the intake in the population.

P03.0530. Use of Public Water Supply Fluoride Concentration as an Indicator of Population Exposure to Fluoride in England 1995-2015

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Abstract: Studies of exposure to fluoride may use Geographic Information Systems to estimate population exposure by geo-referencing water supply zone (WSZ) monitoring data for public water supplies (PWS) to small areas. Geo-referenced fluoride PWS monitoring data were available from 2005-2015, but only non-referenced data from 1995-2004. We aimed to determine whether the geo-referenced fluoride concentrations in 2005-2015 could be used as a proxy for 1995-2004 population exposure. We also aimed to estimate population exposure to fluoride/fluoridation in PWS in England. We allocated annual average PWS fluoride concentrations and fluoridation scheme flagging data from national monitoring data to small areas using GIS. We obtained population data from routine data sources. Mean fluoride concentrations were estimated for each year in each WSZ (a 'zone-year'), for the two periods 1995-2004 and 2005-2015, stratified by fluoridation scheme-flagging. We compared the WSZ-level period means using Spearman correlation. For the geo-referenced data, we estimated spatial and population distribution of the period-average fluoride concentration. Almost all (97%) of the 16,188 zone-years of PWS monitoring observations were linked to WSZ boundaries for 2005-15, but only 8249/21553 (38%) pre-2005 zone-years were linked to their post 2005 WSZs. Grand mean 1995-2004 (0.11mg/l (SD 0.12)) and 2005-2015 (0.11mg/l (SD 0.12)) fluoride concentrations were similar, and WSZ-level means were highly correlated in un-fluoridated zones (Spearman correlation 0.93), but differed (1995-2004 0.74mg/l (SD 0.22), 2005-15 0.78mg/l (SD 0.16)) and correlated weakly in fluoridated zones (correlation 0.31). Most (72%) of the population received PWS with <0.2mg/l fluoride, 18% 0.2-<0.7mg/l, and 10% with ≥0.7mg/l. We estimated population exposure to fluoride in PWS across England in the period 1995-2015. Fluoride concentrations appear stable over time in WSZs, more clearly in zones without a fluoridation scheme.

P03.3460. Prenatal Fluoride Exposure and Symptoms of Attention Deficit Hyperactivity Disorder (ADHD)

Morteza Bashash

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Abstract: INTRODUCTION: Epidemiologic and animal-based studies have raised concerns about the potential neurotoxicity of fluoride exposure as manifested by deficits in IQ and problems with attention. To date, no prospective epidemiologic studies have examined the effects of prenatal fluoride exposure using fluoride biomarkers and sensitive measures of attention. OBJECTIVE: To test the association between prenatal fluoride exposure and symptoms associated with attention-deficit and hyperactivity disorder (ADHD) in 213 Mexican children aged 6-12 years old enrolled in the Early Life Exposures in Mexico to Environmental Toxicants (ELEMENT) birth cohorts between 1997 to 2006. METHOD: We measured urinary fluoride levels during pregnancy and adjusted them for urinary creatinine (MUFcr). The Conners' Rating Scales-Revised (CPRS-R) was completed by mothers as a behavioural measure of attention problems, and the Conners' Continuous Performance Test (CPT-II) was administered to each child to assess sustained attention and inhibitory control. We used gamma regression analyses to examine associations between MUFcr and measures of attention, adjusting for covariates. RESULTS: The mean MUFcr level for all women was 0.85 mg/L (95% CI: 0.81, 0.90) and the Interquartile Range (IQR) was 0.46. In multivariate-adjusted models, a 0.5 mg/L increase in MUFcr (approximately IQR) corresponded to significantly higher CPRS-R scores for DSM-IV Inattention (2.84 points, 95% CI: 0.84, 4.84); Cognitive Problems and Inattention, (2.54 points, 95% CI: 0.44, 4.63), DSM-IV Total ADHD Index (2.38 points, 95% CI: 0.42, 4.34) and ADHD Index (2.47 points; 95% CI: 0.43, 4.50). The shape of the associations suggested a possible ceiling effect. No significant associations were found with outcomes on the CPT-II. Sensitivity analyses did not appreciably alter the results. CONCLUSION: Higher levels of prenatal fluoride exposure were associated with higher symptoms of ADHD measured by CPRS-R in the offspring at age 6-12 years.