News & Announcements

AACTion

American Academy of Clinical Toxicology, Inc.

Volume 20, Number 7
October 2010

President's Corner

Michael I. Greenberg, MD, MPH, FAACT

Well……..here it is, my final "Presidents Message". I finish my term as your President on October 9, 2010, at the AACT business meeting in Denver. I don't have a profound or learned message to send this month; just one from the heart. It involves just a few "thank you's" I would like to extend so here goes…….

First and foremost, I'd like to thank all the members of AACT who allowed me to sit in the role of leader for the organization for the past two years. At the end of the day, it has been a challenge with lots of "interesting" problems and issues to deal with but it's been a great experience that I would not trade.

I want to thank the following colleagues (in no particular order) as well: Randy Bond for his thoughtful personal mentorship during my time as President-Elect; my Executive Committee (Marty Caravati, Karen Simone, Alan Woolf and Randy Bond) for their dedication and hard work; Hugo Kupferschmidt-my EAPCCT counterpart for his wonderful collegiality; Gary Wasserman for his enthusiastic leadership of the Pediatric SIG; Nick Bateman for his world class stewardship of our journal Clinical Toxicology; Donna Segar for always giving me sound advice and valuable friendship; Mike Holland for doing yeoman's work in revitalizing this newsletter and in building the new and improved website (www.clintox.org); Jamie Nelsen for her dedication to AACTion and AACT; Ed Krenzelok for his unwavering support and insightful ideas; Ruddy Rose for his superb development and mentoring of the new and improved "Fellow of AACT" process in his role as Chair of the Fellowship Committee; Jeff Brent for his wise counsel and valued friendship; Tom Kearny for his outstanding leadership of ABAT; John Curtis for his hard work as Occ/Env SIG leader; Allister Vale for his contributions to NACCT and for his untiring work on Current Awareness; Martin Smilkstein for the most stirring and heartfelt Keynote Address ever (NACCT/2009-San Antonio); Leigh DelaTorre and her team from Contemporary Forums for their consistent excellence as the planners/ organizers for NACCT; Art Chang and Ziad Kazzi for developing AACT's new and vitally important Radiation SIG; Elizabeth Scharman for her unrelenting hard work and dedication as the NACCT Planning Chair; Mark Kostic for doing an incredible job as 2010 Abstract Chair; Matt Sztajnkrycer for his meticulous work as Chair of the Education Committee and his hard work on behalf of NACCT; Tony Scalzo for his good

Editor

Michael G. Holland, MD
hollandm@upstate.edu

Assistant Editor
Jamie Nelsen, Pharm.D
nelsenj@upstate.edu

Inside…

AACT*ion* Wants Your News

This is your newsletter, so we want to hear from you. Any and all news is welcome: promotions, lectures, publications, moves, new positions, etc. Have you (or another member you know of) been in the news or interviewed by the press? We want to hear from you. News can be emailed to: cgray@clintox.com or the editors of AACT*ion.*

AACTion

is published by the American Academy of Clinical Toxicology, Inc. exclusively for the use of its members. Articles may not be reproduced without written permission from the Editor, President, and/or Executive Director.

AACT Administrative Office
110 West Lancaster Ave
Wayne, PA 19087
1(877) 377-TOXX (8699)

Phone - (610) 616-5633
Fax - (610) 572-3635
www.clintox.org

Interim Administrative Director
Connie Gray
cgray@clintox.org

Archives of Pediatric Environmental Health Specialty Unit:

Manganese Exposure from a Residential Well Water Filtration System

Michelle Zeager, DO and Alan D. Woolf, MD, MPH, FAACT

The New England Region 1 PEHSU at Children's Hospital, Boston (the Pediatric Environmental Health Center) [PEHC] received correspondence from the parent of a 2-year-old child with a history of behavioral and sensory integration issues. The child may have been chronically exposed to manganese (Mn) in the tap water in the family's home.

Though the child primarily drinks bottled water, he ingested tap water daily during bath time and when brushing his teeth. The home is supplied by well water which was tested when the family moved there one year prior to his birth. This initial testing was done prior to installation of a filtration system and it showed a mildly elevated iron level and a Mn level of 0.05 mg/L. The water was deemed safe for drinking by the local water district. In order to prevent staining of porcelain from the iron, a filtration system which uses manganese greensand as the filtration media was installed shortly after testing was completed. Approximately one year prior to PEHSU presentation, after routine plumbing work, the family noticed black specs of material in the tap water periodically. Routine maintenance on the filtration system a few weeks prior to the PEHSU visit revealed that the black specs in the water were the greensand filtration media escaping the filtration tank and entering the house pipes. The filtration system was promptly disconnected and only bottled water was consumed. Samples of water from three taps in the home were tested. No Mn was detected in one sample, however, the two others showed Mn levels of 0.11 mg/L, which is above The U.S. Environmental Protection Agency (EPA) National Secondary Drinking Water Standard of 0.05 mg/L. The filtration system was repaired, all faucets in the home were run for an extended period of time to wash out any potential remaining contaminants, repeat testing revealed no detectable Mn, and all other water quality testing met established standards.

At the PEHC, physicians thoroughly reviewed the environmental and health history and all written outside documentation of material safety data sheets (MSDS) for the filtration media, reviewed all water testing results, and recommended that the child have a 24-hour urine collected to measure manganese. The child had a physical assessment through the primary care provider and had no acute health issues. A blood Mn level was reportedly within normal limits. The 24-hour urinary Mn was 0.8 ug/L (laboratory reference range 0.0 to 2.0 ug/L). Physicians discussed the difficulties in interpreting laboratory results due to lack of good correlation between biological matrices and clinical findings or health effects of manganese. We also discussed the essential role of manganese in humans and animals as well as potential health effects from chronic Mn overdosing. We further recommended that regular maintenance of the filtration system and testing of the well water be performed to ensure that the system is functioning properly and that the water remains safe to consume. The child will be followed closely by his pediatrician and has been referred to a neurologist regarding the behavioral and sensory integration issues. Neuropsychological testing will be considered.

Manganese is a naturally occurring trace element found in rocks, soil, dust and water that has important biochemical and nutritional roles in humans and animals. It has been shown to be necessary in normal physiological function and is essential in activation of several enzymatic pathways. Exposure to Mn can occur through food sources, nutritional supplements, and drinking water. Primary exposure occurs through diet (an adequate intake for

President's Message Continued:

humor and consistent contributions to the organization and to NACCT; Cynthia Morris Kukoski for her leadership of the Forensic SIG and her upcoming leadership of ABAT; Frank Walter for his role in AHLS and the AACT partnership in that endeavor; Milt Tenebein for his sage advice; Steve Seifert for his dedication to the Envenomations SIG; Randy Zeitman for his web/IT expertise; Robin McFee for developing the WMD SIG; Michael McGuigan for his contributions to AACT that held the organization together during some tough times; my European colleagues (and friends) EAPCCT President Simon Thomas, Irma DeVries (EAPCCT President-Elect), Sally Bradberry, Alex Campbell, Martin Wilks, Jan Meulenbelt, Phillipe Hansen, and Peter Hulten, for their unwavering support and assistance in furthering the strong association between AACT and EAPCCT; the entire AACT Board of Trustees for their selfless hard work (Rob Palmer, Chris Holstege, David Juurlink, Maria Zappala-Mercurio, Jeff Nemhauser, Sean Nordt, Tony Thomassoni, Debra Kent, John Curtis, Marty Carvati, Karen Simone, Alan Woolf, Randy Bond); Sean Bryant and Tony Scalzo for their leadership of the vibrant Intensive/Critical Care SIG; my AAPCC counterpart Sandy Giffin for her insightful and steady-handed leadership of our NACCT partner; Connie Gray the interim Administrative Director who stepped in at a critical time to help stabilize AACT; Olga Woo and Miguel Fernandez for their excellence in developing and shepherding the Herbs and Dietary Supplements SIG.

On October 9, 2010, I will be privileged to pass the AACT baton into the steady and very capable hands of soon-to-be President Alan Woolf and President-Elect Bob Hoffman. Thank you again to everyone.

Manganese Exposure Continued

children is about 1.5-2.0 mg/day). Good Mn sources include beans, whole wheat bread, oatmeal, pecans and other nuts, raisin bran cereal, spinach, mustard greens, kale, and tea. Mn is also used in industries such as steel or glass production, as a component of some fungicides, and as an anti-knock additive in gasoline. The exposure in these settings is primarily through inhalation.

In high doses and primarily through chronic inhalation exposure in the workplace, Mn can be associated with neurological health effects such as weakness, tremors, gait and speech disturbances, muscle spasms, irritability, and difficulty with memory or concentration. "Manganism" is well-described in the literature. Acute exposure has been found to be associated with lung injury as well. Studies in children have suggested that they may be more susceptible to the metal's adverse effects. High doses may be associated with adverse changes in behavior, decreased ability to learn, and lower testing scores (though much is still unknown regarding its health effects in children).

The US EPA has set secondary drinking water standards for manganese of 0.05 mg/L. Secondary standards are non-enforceable guidelines that are designed to address aesthetic or cosmetic effects of a contaminant in drinking water and are not designed to be protective of human health. The World Health Organization (WHO) has set a safe drinking guideline of 0.4 mg/L.

In this case, the PEHSU served as an agency providing needed expertise in the medical toxicological effects of manganese as well as the essential role it plays in maintaining good health. The PEHSU was able to provide information, recommendations, and reassurance for the family in a timely manner responding to their questions and interpretation of environmental and biological testing.

Resources

1. Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological Profiles. http://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=23
2. Environmental Protection Agency (EPA). Integrated Risk Information System. http://www.epa.gov/IRIS/subst/0373.htm
3. Environmental Protection Agency (EPA). Drinking Water Contaminants. http://water.epa.gov/drink/contaminants/index.cfm#Inorganic
4. National Institutes of Environmental Health Sciences. National Institutes of Health. Manganese and Brain Damage. http://www.niehs.nih.gov/health/impacts/manganese.cfm
5. World Health Organization (WHO). http://www.who.int/water_sanitation_health/dwq/chemicals/manganesesum.pdf

Acknowledgements

The Pediatric Environmental Health Specialty Program is funded (in part) by the cooperative agreement award number 1U61TS000118-01 from the Agency for Toxic Substances and Disease Registry (ATSDR)

Acknowledgement: The U.S. Environmental Protection

Upcoming Meetings

NACCT 2010
October 7-12, 2010
Denver, CO
www.clintox.org

Society of Forensic Toxicologists (SOFT)
October 18 - 22, 2010
Richmond, VA
http://www.soft-tox.org/

ACMT Seminars in Forensic Toxicology: Opioids
November 8&9, 2010
Philadelphia, PA
http://acmt.net/cgi/page.cgi?event_id=48&_id=23&action=new

ACMT Joint American-Israeli Medical Toxicology Conference
November 16&17, 2010
Haifa, Israel
http://www.acmt.net/_Library/Meeting_Brochures/ACMT-IST_Registration_Form.pdf

ACMT Seminars in Forensic Toxicology: Ethanol & Marijuana
December 13&14, 2010
San Francisco, CA
San Francisco, CA

Pacifihem 2010
The International Chemical Congress of Pacific Basin Societies Sponsors
Honolulu, HI
December 15-20, 2010
http://pacifichem.org/

2011 ACMT Spring Conference
Tots, Teens & Toxicology:
Current Drug and Environmental Threats to Children's Health
March 18-20, 2011
Clearwater, FL

XXXI International Congress of the European Association of Poisons Centres and Clinical Toxicologists
May 24-27, 2010
Dubrovnic, Croatia
http://www.eapcct.org/show.php?page=congress