Mercury overexposure and atrial fibrillation

To the Editor,

We read with great interest the article entitled "An arrhythmic episode after mercury exposure and successful treatment with chelation therapy: A case report." by Karakulak et al. (1) reporting a case of acute mercury (vapor) poisoning followed by 7-day history of malaise, fatigue, proximal weakness in the legs and in the arms, atypical chest pain, and palpitation in a 32-year-old woman in published Anatol J Cardiol 2015; 15: 589-90. The syndrome of acute mercury toxicity became manifest within 24 h after metallic mercury (Hg^0) overexposure (1). The source of acute intoxication was the release of elemental (Hg^0) from a broken fluorescent lamp (1). We applaud this interesting work, but we would like to raise one issue regarding its interpretation. There is no doubt that mercury (as elemental mercury and/or mercuric oxide) is released from a broken fluorescent lamp (2). But if the latter does emit sizable amounts of (Hg^0) (3), some other metallic elements may be released from broke bulbs and/or tube (4), potentially causing adverse cardiovascular effects (5). When a fluorescent lamp is broken, arsenic (As) and lead (Pb) are also released into the air (4), and they are considered potentially harmful to the heart (5). During accidental exposures, both arsenic (As) and lead (Pb) may contribute to arrhythmia and tachycardia in humans (5). Therefore, in the case under discussion, the episode of paroxysmal atrial fibrillation may be related to the additive toxic effects induced by the combination of multiple exposures to heavy metals [i.e., elemental metallic mercury (Hg^0), arsenic (As), and lead (Pb)]. The authors (1) are to be commended on their case report of a woman with cardiac arrhythmia after mercury intoxication and their high index of suspicion and careful analysis of the mercury in bioindicators (i.e., whole blood and urine).

Gianpaolo Guzzi, Anna Ronchi[1], Paolo D. Pigatto[2]
Italian Association for Metals and Biocompatibility Research – A.I.R.M.E.B.; Milan-*Italy*
[1]Pavia Poison Control Center and National Toxicology Information Centre, Toxicology Unit, IRCCS Maugeri Foundation and University of Pavia-*Italy*
[2]Department of Biomedical, Surgical and Dental Sciences, Unit of Oral Pathology and Medicine, IRCCS Galeazzi Hospital, University of Milan; Milan-*Italy*

References

1. Karakulak UN, Gündüzöz M, Tutkun E, Yılmaz OH. An arrhythmic episode after mercury exposure and successful treatment with chelation therapy: A case report. Anatol J Cardiol 2015; 15: 589-90. [CrossRef]
2. Nance P, Patterson J, Willis A, Foronda N, Dourson M. Human health risks from mercury exposure from broken compact fluorescent lamps (CFLs). Regul Toxicol Pharmacol 2012; 62: 542-52. [CrossRef]
3. Salthammer T, Uhde E, Omelan A, Ludecke A, Moriske HJ. Estimating human indoor exposure to elemental mercury from broken compact fluorescent lamps (CFLs). Indoor Air 2012; 22: 289-98. [CrossRef]
4. Taghipour H, Amjad Z, Jafarabadi MA, Gholampour A, Norouz P. Determining heavy metals in spent compact fluorescent lamps (CFLs) and their waste management challenges: some strategies for improving current conditions. Waste Manag 2014; 34: 1251-6. [CrossRef]
5. Goyer RA, Clarkson TW. Toxic effects of metals. In; Klaassen CD Casarett & Doull's Toxicology: The basic of poisons. 6th ed. New York: McGraw-Hill Medical Pub. Division; 2001. p. 822-6.

Address for Correspondence: Dr. Gianpaolo Guzzi
Department of Dental Toxicology,
Italian Association for Metals and Biocompatibility,
Research – A.I.R.M.E.B., (not-for-profit organization)
Via A. Banfi, 4, 20122; Milan-*Italy*
Phone: +39-02-782 561 Fax: +39-02-367 355 40
E-mail: gianpaolo_guzzi@fastwebnet.it
Accepted Date: 02.11.2015
©Copyright 2016 by Turkish Society of Cardiology - Available online at www.anatoljcardiol.com
DOI:10.14744/AnatolJCardiol.2015.6766

Author`s Reply

To the Editor,

First, we would like to thank for this laudatory and questioning comments to our report entitled "An arrhythmic episode after mercury exposure and successful treatment with chelation therapy: A case report." in this issue of Anatol J Cardiol 2015; 15: 589-90 (1). It is very important that any accompanying toxic exposure should be considered in case of a specific toxic exposure. In our center, we often admit patients with multiple metal or toxic agent exposures, especially in case of occupational exposure. We have a toxicologic laboratory capable of analyzing dozens of heavy metals and toxic agents such as lead, arsenic, cadmium, mercury, nickel, mandelic acid, phenylglycolic acid, and trichloroacetic acid. In this patient, we performed detailed toxicologic analysis and only found a significant elevation in mercury levels. We thank again the authors for their attention and giving us this opportunity to clarify.

Uğur Nadir Karakulak
Departments of Cardiology, Ankara Occupational Diseases Hospital; Ankara-*Turkey*

Reference

1. Karakulak UN, Gündüzöz M, Tutkun E, Yılmaz OH. An arrhythmic episode after mercury exposure and successful treatment with chelation therapy: A case report. Anatol J Cardiol 2015; 15: 589-90. [CrossRef]

Address for Correspondence: Dr. Uğur Nadir Karakulak
Ankara Meslek Hastalıkları Hastanesi, Kardiyoloji Bölümü
P. O: 06280 Keçiören, Ankara-*Türkiye*
Phone: +90 312 580 81 81 Fax: +90 312 311 40 58
E-mail: ukarakulak@gmail.com