

Mercury warns people at Norochcholai and Puttalam!

Hemantha Withanage¹, Chalani Rubesinghe², Indika Rajapaksha³
Centre for Environmental Justice

Summary

The recent study on mercury in hair that CEJ involved reveals that the residents in the Norochcholai, Paniadiya, Narakkaliya and around the Puttalam town area vicinity to the lagoon are exposed to Mercury at dangerous levels. 28 women between 18 to 44 years old that had no occupational Mercury exposure found to have Mercury in their hair above 1ppm, the level that United States National Research Council established as a “reference dose” in 2000 (U.S. EPA 2001). The maximum was 15.584 ppm. The study focused on the Mercury contamination through lagoon fish consumption. Hopefully connected to the fly ash from the Norochcholai Coal Power Plant.

CEJ urge the relevant authorities to find the source/s of exposure and act upon preventing contamination before this become another Minamata city. As a party to the Minamata Convention Sri Lanka is bound to eliminate all sources of Mercury by 2020.

Introduction

Mercury is a bio-accumulative, toxic and persistent heavy metal that a human can only tolerate up to 1 ppm in hair, 50 µg/g creatinine in urine and 4- 5 µg/L in blood. For methylmercury that can be coming from consumption of fish the tolerable intake is only 0.1 µg/ kg body weight per day⁴. However the total bearable mercury level in the body is only 2 µg/ kg body weight per day. The sources for total mercury include fish, airborne mercury, and mercury contaminated products such as cosmetics, pesticides, etc. Once these levels are exceeded mercury can affect the central nervous, cardiovascular, immune and reproductive systems. In pregnant women mercury passes through the placenta and interferes with the development of the foetus. In children, mercury causes attention deficit and developmental delays.

Mercury in hair is an indicator of the environmental exposure to mercury. It can be coming from blood or exogenous sources (outside of the body)⁵. There’s no correlation between the level of mercury in hair and blood or urine.

¹ Executive Director and the Senior Environmental Scientist, CEJ

² Senior Environmental Officer, CEJ

³ Environmental Officer, CEJ

⁴ <https://www.env-health.org/IMG/pdf/2->

[Halting the child brain drain Why we need to tackle global mercury contamination.pdf](#)

⁵ <http://www.annclinlabsci.org/content/36/3/248.full>

Separate testing should be conducted to measure the levels of mercury in blood and urine. However, A study shows that if the methyl mercury concentration in a pregnant mother's body is enough to increase the mercury level in hair by 1ppm, the respective decrease in the IQ of the child is 0.7 points⁶.

In 2014, a study on fish and hair mercury conducted in Thailand proved that people and fish could get contaminated with mercury due to coal-fired power plant. Over 85% of fish samples and all the hair samples exceeded 1ppm. Coal fired power plants does account for about 24% of global mercury emissions. Mercury bound to particles is often deposited adjacent to the source while that enters the atmosphere stays for months to years.⁷

The study

Centre for Environmental Justice participated in a hair monitoring for mercury around the Puttlam lagoon, vicinity to the Norochchulai power plant, a possible source of mercury, located in the Kalpitiya Peninsula between the Indian Ocean and Puttalam lagoon. Around the world, coal burned power plants are the major source of mercury contamination. Although the mercury level in coal should be tested before burning coal, Norochcholei coal power plant does not seem to be conducting such test for mercury.

Sampling was conducted using protocols developed by IPEN and the Biodiversity Research Institute (BRI) measured mercury levels (total mercury content = THg) in hair samples in its laboratory in Gorham, Maine, USA. Samples were taken in total; 21 from Norochcholei and 15 from Puttlum area.

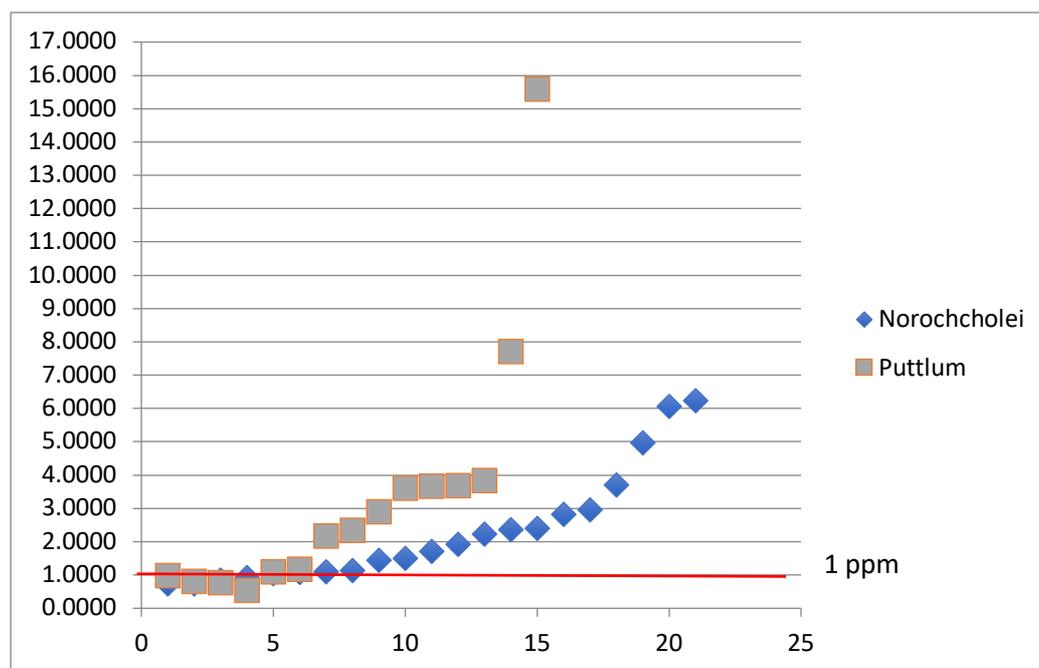


Figure 1: Results of the hair sampling study

Out of the women participated, 17 from Norochcholei and 11 from Puttlum had mercury in hair exceeding the internationally recognized reference level of 1 ppm total mercury (THg), above which health effects to the developing foetus of pregnant women may occur⁸. The age limit of the women is between 18 and 44.

The results indicate the concentration of total mercury in the hair and the exposure to mercury during the immediate past few months, as the average rate of hair growth is approximately 1 cm per month⁹. There was no significant difference in the fish diet of women having greater than and below 1ppm of mercury. They all seemed to

⁶ <https://www.ncbi.nlm.nih.gov/pubmed/16242602>

⁷ http://www.briloon.org/uploads/BRI_Documents/Mercury_Center/BRI-IPEN-report-update-102214%20for%20web.pdf

⁸ https://ipen.org/sites/default/files/documents/ipen-mercury-sids-exec-summary-v1_7-en-web.pdf
https://ipen.org/sites/default/files/documents/ipen-mercury-sids-v1_5-en-web.pdf

consume the set of same fish species, sometimes cooked together. Those include *Liza sp.* (Mullet/ “Godaya”), *Siganus sp.* (Rabbitfish/ “Orawa”), *Chanos chanos* (Milkfish/ “wekkaya”), *Lethrinus nebulosus* (Spangled emperor/ “Meewati”), *Gerres sp.* (Silverbiddies / “Thirali”), *Dasyatis pastinaca* (Sting ray fish/ maduwaa), *Clupea harengus* (Herring/ “Hurulla”), *Mystus gulio* (Long Whiskers Catfish/ “Anguluwa”), *Katsuwonus pelamis* (Skipjack tuna/ “Balaya”) and shellfish. However, the women participated in the research mostly eat lagoon fish such as wekkaya, godaya, anguluwa, etc.

Fish consumption is the primary sources of methyl mercury contamination in human. However, the degree of contamination increases in people living in a mercury-contaminated area. Elemental/ metallic mercury is easily absorbed from the environment. It is possible to alter the mercury content in hair due to soaps, creams, shampoos, hair sprays, lotions, dyes, bleaches, and waving solutions.

Among these sources, mercury in fish could be the closest source for this high level of mercury in hair. According to our survey they consume 4 -15 meals of lagoon fish per week. It is known that the lagoon get contaminated with effluents from the coal power plant and fly ash due to strong winds in the area. in the past several years time to time. Mercury gets evaporated above 40 centigrade and if mercury is available in coal they could have spread in the area both as vapour, dust and bound to other particles.

It is believed that the exposure to elemental mercury is possibly due to the fly ash of the Coal power plant and the blowing away of the stored coal ash at the Norochcholei coal power plant premises. Contaminated air and water also contribute significantly to the daily intake of total mercury. Exposure through cosmetics can be considered negligible due to the socio-economic background of the study population. Further studies are necessary to confirm the soil contamination and thereby the contamination level in crop cultivated in the area through fertilizers/ pesticides/ fungicides applied to the fields.

Recommendations

It is difficult to predict the toxicity due to mercury in the studied population without conducting a proper blood or urine test for mercury. Yet, it is clear that they are vulnerable to mercury contamination from the surrounding environment. Thereby CEJ recommends;

- **The government** to; Monitor the environmental mercury in air, water, soil and food sources of the around the Puttlam lagoon and test the levels of mercury in the coal supplied to the power plant and include the level of mercury in the coal specifications.
- **The media** to Increase awareness among people on the risk and push the relevant authorities to take action.

Acknowledgement

We acknowledge IPEN, Biodiversity Research Institute (BRI) and Arnika for the opportunity given to CEJ in linking Sri Lanka to this global study and for the immense support given in conducting the survey and sampling.

More Information

Hemantha Withanage -0777600503 | CEJ - 0112683282



CENTRE FOR ENVIRONMENTAL JUSTICE

20A, Kuruppu Road, Colombo 08, SRI LANKA Telephone: 0112683282 email: info@ejustice.lk
