



Epidemiological Alert:

Mercury in Skin Lightening Products

1 June 2012

Many skin lightening creams and soaps contain some form of mercury as an active agent. But mercury is dangerous. It can cause kidney damage and may also cause skin rashes, skin discoloration and scarring, as well as a reduction in the skin's resistance to bacterial and fungal infections, as stated in the World Health Organization (WHO) June 2012 Information Sheet.

The Pan American Health Organization / World Health Organization (PAHO / WHO) recommends that Member States promote public awareness of skin whitening products that may contain any chemical form or compound of mercury and the risks associated with exposures to different forms of mercury.

Introduction

Mercury is a common ingredient found in skin lightening soaps and creams. It is also found in other cosmetics, such as eye makeup cleansing products and mascara.¹⁻³ Skin lightening soaps and creams are commonly used in certain African and Asian nations.^{1,4,5} They are also used among dark-skinned populations in Europe and North America.^{2,6,7} Mercury salts inhibit the formation of melanin, resulting in a lighter skin tone.^{8,9}

Mercury in cosmetics exists in two forms: inorganic and organic.^{3,10,11} Inorganic mercury (e.g. ammoniated mercury) is used in skin lightening soaps and creams. Organic mercury compounds (thiomersal [ethyl mercury] and phenyl mercuric salts) are used as cosmetic preservatives in eye makeup cleansing products and mascara.^{1-3,12}

Products, packaging and ingredients

- Skin lightening products come in different forms, including soaps and creams; the soap is often sold as "antiseptic soap".^{1,2} These products are supposed to be applied to the skin to dry overnight.² Women use the soap to wash their hair, arms or face or their entire body.² It is reported that some women use these products for as long as 20 years.¹
- The soaps come in bar form and are sold individually in boxes.⁶ The creams are generally packaged in tubes or jars.⁶ The soaps contain approximately 1–3% mercury iodide, and

Use, production and availability

In Mali, Nigeria, Senegal, South Africa and Togo, 25%, 77%, 27%, 35% and 59% of women, respectively, are reported to use skin lightening products on a regular basis.¹

In 2004, nearly 40% of women surveyed in China (Province of Taiwan and Hong Kong Special Administrative Region), Malaysia, the Philippines and the Republic of Korea reported using skin lighteners.¹

In India, 61% of the dermatological market consists of skin lightening products.³

Skin lightening products are manufactured in many countries; for example, consumer protection agencies in the European Union¹³⁻¹⁸ and the United States of America (USA)^{19,20} have identified mercury-containing products made in China,^{13,16,19,20} the Dominican Republic,^{1,19} Lebanon,^{13,21} Mexico,^{19,22} Pakistan,^{13,14} the Philippines,^{13,15} Thailand,^{13,17,23} and the USA.^{13,18}

Mercury-containing skin lightening products are available for sale over the Internet.

A 2011 survey funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety noted that individuals from Brazil, Kyrgyzstan, Mexico and the Russian Federation believe that mercury-containing skin lightening products are easy to obtain.²⁴

Some manufacturers are no longer using mercury as a preservative in mascara and eye makeup cleansing products as a result of consumer pressure. However, most jurisdictions still allow the sale of makeup products containing mercury compounds.²⁵

- the creams are composed of 1–10% mercury ammonium.² Some soap products tested contained mercury at concentrations up to 31 mg/kg, whereas cream products had mercury concentrations as high as 33 000 mg/kg.²⁶
- Products with very high levels of mercury contamination look grey or cream coloured.²⁷
- The amount or concentration of mercury in a product may be labelled on the packaging or in the ingredient list. Names to look for include mercury, Hg, mercuric iodide, mercurous chloride, ammoniated mercury, amide chloride of mercury, quicksilver, cinnabaris (mercury sulfide), hydrargyri oxydum rubrum (mercury oxide), mercury iodide or “poison”; directions to avoid contact with silver, gold, rubber, aluminium and jewellery may also indicate the presence of mercury.^{1,6} However, companies selling products that contain mercury, do not always list it as an ingredient.

Health effects and how to measure exposure

- The main adverse effect of the inorganic mercury contained in skin lightening soaps and creams is kidney damage.⁹ Mercury in skin lightening products may also cause skin rashes, skin discoloration and scarring, as well as a reduction in the skin's resistance to bacterial and fungal infections.^{1,3} Other effects include anxiety, depression or psychosis and peripheral neuropathy.¹⁻³
- The medical literature reports specific instances of individuals suffering from the aforementioned health effects following exposure to mercury through skin lightening creams and soaps. One case report describes a 34-year-old Chinese woman who developed nephrotic syndrome, a condition marked by high levels of protein in the urine. The mercury levels in her blood and urine returned to normal one month and nine months, respectively, after she stopped using the skin lightening cream.²⁸
- One study indicated a large proportion of nephrotic syndrome among African women using ammoniated mercuric chloride-containing skin lightening creams for periods ranging from one month to three years. Over three quarters of the women who stopped using the creams went into remission.^{9,29}
- Mercury in soaps, creams and other cosmetic products is eventually discharged into wastewater. The mercury then enters the environment, where it becomes methylated and enters the food-chain as the highly toxic methylmercury in fish. Pregnant women who consume fish containing methylmercury transfer the mercury to their fetuses, which can later result in neurodevelopmental deficits in the children.²
- Exposure to inorganic mercury can be quantified through measurements in blood and urine.¹⁰

Regulations

- Distribution of mercury-containing creams and soaps is banned in the European Union and numerous African nations.^{2,24,30}
- A European Union Directive specifies that mercury and mercury compounds are not allowed as ingredients in cosmetics (including soaps, lotions, shampoos and skin bleaching products). However, phenyl mercuric salts for use as a preservative in eye makeup and eye makeup removal products are allowed at concentrations equal to or less than 0.007% by weight.¹
- The United States Food and Drug Administration allows mercury compounds in eye area cosmetics at concentrations at or below 65 mg/kg expressed as mercury (approximately 100 mg/kg expressed as phenylmercuric acetate or nitrate).³¹ All other cosmetics must contain

mercury at a concentration less than 1 mg/kg. The presence of mercury must be unavoidable under good manufacturing practice.³¹

- Health Canada's draft guidance on heavy metal impurities in cosmetics specifies a limit of 3 mg/kg for mercury as an impurity in cosmetic products.³²⁻³⁴
- The Philippines is reported to have banned skin lightening products with mercury levels exceeding the national regulatory limit of 1 mg/kg in 2011.²³

Regulatory body	Limits for cosmetics other than eye area products
European Union	Banned ³⁰
Many African nations	Banned ^{2,24}
United States Food and Drug Administration	< 1 mg/kg ³¹
Health Canada	≤ 3 mg/kg ³²⁻³⁴
Philippines Food and Drug Administration	≤ 1 mg/kg ²³
Regulatory body	Limits for eye area products
European Union	≤ 0.007% by weight ¹
United States Food and Drug Administration	≤ 65 mg/kg expressed as mercury (approximately 100 mg/kg expressed as phenylmercuric acetate or nitrate) ³¹

Conclusions

- Mercury-containing skin lightening products are hazardous to health and as a result have been banned in many countries. However, there are reports of such products still being available to consumers, and they are advertised on the Internet. For example, the Texas Department of State Health Services reported the availability of a mercury-containing beauty cream on 1 September 2011.²⁷
- Public awareness needs to be raised regarding the types of products and the specific products that contain mercury and the risks associated with mercury exposure.
- The 2011 survey described previously states that "Consumers gravitated to known mercury-free choices in countries that had government seals and/or regulation about mercury content."²⁴
- Information on alternatives must also be provided, because skin lightening products that do not contain mercury may contain other hazardous substances.

For further WHO information on mercury, please visit:

http://www.who.int/ipcs/assessment/public_health/mercury/en/index.html

References

1. UNEP (2008). *Mercury in products and wastes*. Geneva, United Nations Environment Programme, Division of Technology, Industry and Economics, Chemicals Branch (<http://www.unep.org/hazardoussubstances/LinkClick.aspx?fileticket=atOtPM-tTmU%3d&tabid=4022&language=en-US>).
2. Glahder CM, Appel PWU, Asmund G (1999). *Mercury in soap in Tanzania*. Copenhagen, Ministry of Environment and Energy, National Environmental Research Institute (NERI Technical Report No. 306; http://www2.dmu.dk/1_viden/2_publicationer/3_fagrappporter/rapporter/fr306.pdf).
3. Ladizinski B, Mistry N, Kundu RV (2011). Widespread use of toxic skin lightening compounds: medical and psychosocial aspects. *Dermatologic Clinics*, 29:111–123.
4. WHO (2008). *Guidance for identifying populations at risk from mercury exposure*. Geneva, World Health Organization (<http://www.who.int/entity/foodsafety/publications/chem/mercury/en/>).
5. Lindsey K, Balagizi I, Hirt HM (2009). *Be black and beautiful*. Winnenden, anamed international.
6. New York City Department of Health and Mental Hygiene (2011). *Mercury in soaps and creams*. New York, NY, Department of Health and Mental Hygiene (http://www.nyc.gov/html/doh/html/epi/mercury_sc.shtml).
7. McKelvey W, Jeffery N, Clark N, Kass D, Parsons PJ (2011). Population-based inorganic mercury biomonitoring and the identification of skin care products as a source of exposure in New York City. *Environmental Health Perspectives*, 119(2):203–209.
8. Engler DE (2005). Letter to the editor: Mercury “bleaching” creams. *Journal of the American Academy of Dermatology*, 52(6):1113–1114.
9. IPCS (2003). *Elemental mercury and inorganic mercury compounds: human health aspects*. Geneva, World Health Organization, International Programme on Chemical Safety (Concise International Chemical Assessment Document 50; <http://www.who.int/entity/ipcs/publications/cicad/en/cicad50.pdf>).
10. ATSDR (1999). *Toxicological profile for mercury*. Atlanta, GA, Agency for Toxic Substances & Disease Registry (<http://www.atsdr.cdc.gov/toxprofiles/TP.asp?id=115&tid=24>).
11. WHO (2007). *Exposure to mercury: a major public health concern*. Geneva, World Health Organization (Preventing disease through healthy environments series; <http://www.who.int/phe/news/Mercury-flyer.pdf>).
12. Al-Saleh I, Al-Doush I (1997). Mercury content in skin-lightening creams and potential hazards to the health of Saudi women. *Journal of Toxicology and Environmental Health*, 51(2):123–130.
13. RAPEX (2011). *The Rapid Alert System for Non-Food Products* (http://ec.europa.eu/consumers/dyna/rapex/rapex_archives_en.cfm; enter “mercury” in the search box).
14. 30. RAPEX (2011). *The Rapid Alert System for Non-Food Products*, 2011 week 31, No. 33, Reference 0461/11 (http://ec.europa.eu/consumers/dyna/rapex/create_rapex.cfm?rx_id=385).

15. 31. RAPEX (2007). *The Rapid Alert System for Non-Food Products*, 2007 week 29, No. 22, Reference 0732/07 (http://ec.europa.eu/consumers/dyna/rapex/create_rapex.cfm?rx_id=142).
16. 32. RAPEX (2009). *The Rapid Alert System for Non-Food Products*, 2009 week 49, No. 8, Reference 1625/09 (http://ec.europa.eu/consumers/dyna/rapex/create_rapex.cfm?rx_id=268).
17. 33. RAPEX (2009). *The Rapid Alert System for Non-Food Products*, 2009 week 28, No. 3, Reference 0954/09 (http://ec.europa.eu/consumers/dyna/rapex/create_rapex.cfm?rx_id=245).
18. RAPEX (2006). *The Rapid Alert System for Non-Food Products*, 2006 week 31, No. 13, Reference 0491/06 (http://ec.europa.eu/consumers/dyna/rapex/create_rapex.cfm?rx_id=91).
19. USFDA (2011). *Import alert: Detention without physical examination of skin whitening creams containing mercury*. Silver Spring, MD, United States Department of Health and Human Services, Food and Drug Administration (Import Alert No. 53-18; http://www.accessdata.fda.gov/cms_ia/importalert_137.html).
20. USFDA (2011). *Import alert: Detention without physical examination of unapproved new drugs promoted in the U.S.* Silver Spring, MD, United States Department of Health and Human Services, Food and Drug Administration (Import Alert No. 66-41; http://www.accessdata.fda.gov/cms_ia/importalert_190.html).
21. RAPEX (2006). *The Rapid Alert System for Non-Food Products*, 2006 week 24, No. 16, Reference 0356/06 (http://ec.europa.eu/consumers/dyna/rapex/create_rapex.cfm?rx_id=83).
22. Peregrino CP, Moreno MV, Miranda SV, Rubio AD, Leal LO (2011). Mercury levels in locally manufactured Mexican skin-lightening creams. *International Journal of Environmental Research and Public Health*, 8(6):2516–2523.
23. Anonymous (2011). FDA bans skin whitening products due to mercury content. *The Manila Paper*, 6 August 2011 (<http://manila-paper.net/fda-bans-skin-whitening-products-due-to-mercury-content/8021>).
24. Uram E, Bischofer BP, Hagemann S (2010). *Market analysis of some mercury-containing products and their mercury-free alternatives in selected regions*. Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH, March (GRS-253; <http://www.ipen.org/ipenweb/documents/ipen%20documents/grs253.pdf>).
25. Weinberg J (2010). *An NGO introduction to mercury pollution*. International POPs Elimination Network (http://www.ipen.org/ipenweb/documents/book/ipen%20mercury%20booklet_s.pdf).
26. MDH (2011). *Skin-lightening products found to contain mercury*. Minnesota Department of Health (<http://www.health.state.mn.us/topics/skin/>).
27. Texas DSHS (2011). *DSHS warns of mercury poisoning linked to Mexican beauty cream*. News release, 1 September 2011. Texas Department of State Health Services (<http://www.dshs.state.tx.us/news/releases/20110901.shtm>).
28. Tang HL, Chu KH, Mak YF, Lee W, Cheuk A, Yim KF, Fung KS, Chan HWH, Tong KL (2006). Minimal change disease following exposure to mercury-containing skin lightening cream. *Hong Kong Medical Journal*, 12(4):316–318.

29. Barr RD, Rees PH, Cordy PE, Kungu A, Woodger BA, Cameron HM (1972). Nephrotic syndrome in adult Africans in Nairobi. *British Medical Journal*, 2(5806):131–134.
30. IPCS (1991). Mercury-containing cream and soap. In: *Inorganic mercury*. Geneva, World Health Organization, International Programme on Chemical Safety (Environmental Health Criteria 118; <http://www.inchem.org/documents/ehc/ehc/ehc118.htm#SectionNumber:3.5>).
31. USFDA (2000). *Cosmetics: ingredients prohibited & restricted by FDA regulations. Updated May 30, 2000*. Silver Spring, MD, United States Department of Health and Human Services, Food and Drug Administration (<http://www.fda.gov/Cosmetics/ProductandIngredientSafety/SelectedCosmeticIngredients/ucm127406.htm>).
32. Health Canada (2009). *Draft guidance on heavy metal impurities in cosmetics*. Ottawa, Ontario, Health Canada (<http://www.hc-sc.gc.ca/cps-spc/legislation/consultation/cosmet/metal-metaux-consult-eng.php>).
33. Health Canada (2011). *Heavy metals in cosmetics—fact sheet*. Ottawa, Ontario, Health Canada (http://www.hc-sc.gc.ca/cps-spc/pubs/indust/heavy_metals-metaux_lourds/index-eng.php).
34. Environmental Defence Canada (2011). *Heavy metal hazard. The health risks of hidden heavy metals in face makeup*. Toronto, Ontario, Environmental Defence Canada (http://environmentaldefence.ca/sites/default/files/report_files/HeavyMetalHazard%20FINAL.pdf).