

The epidemic of PPD sensitization and the urgency of using pure henna

Up to the late 1990's, about 3% of people were allergic to chemical hair dye and the allergic reactions were rarely life threatening. An estimated 1.5% of people are born allergic to para-phenylenediamine, others acquire sensitivity through exposure to the chemical during their lives. In 1998, an epidemic of exposure to para-phenylenediamine began, and the sensitization epidemic followed.



The globalization of 'black henna' temporary tattoos created with para-phenylenediamine began in 1998 with the February release of the "Frozen" video from "Ray of Light" by Madonna. By spring 1998, millions of people worldwide had seen the video, the 'black henna' on Madonna's hands and wanted to acquire a 'black henna' temporary tattoo on their summer vacation. Hopeful artists who caught onto the 'secret formula' purchased boxes of Bigen black hair dye and painted para-phenylenediamine onto people, having no idea that the high chemical content and prolonged skin exposure was dangerous. Other entrepreneurs advertised 'black henna' kits online and orders flooded in. Beachfronts such as the boardwalk on Venice Beach quickly filled up with artists advertising 'black henna' and lines of customers formed. The reports of injuries followed but were often misdiagnosed, as physicians had never seen such injuries before. By 2005, in some broad sensitization assays, 8% of adolescents were allergic to para-phenylenediamine, almost tripling in ten years the sensitization to a chemical frequently found in consumer products.²

The numbers have risen sharply because of the extremely high para-phenylenediamine content in the 'black henna' paste. Kligman's sensitization assay in 1966 found that 100% of people would become sensitized to para-phenylenediamine in five or fewer exposures to a test patch of 10%

¹ Victoria Villalobos. "Debating; Venice Beach, CA." Uploaded to Smiledarling Photostream, Flickr, November 29, 2009. <http://www.flickr.com/photos/smiledarling/4284305642/> (accessed November 22, 2013).

² Smith V, Clark S, and Wilkinson M. "Allergic contact dermatitis in children: trends in allergens, 10 years on. A retrospective study of 500 children tested between 2005 and 2014 in one U.K. centre." *British Association of Dermatologists' Annual Conference*. Leeds Teaching Hospitals NHS Trust, Leeds, U.K. (2015).

para-phenylenediamine.³ All ‘black henna’ pastes that stain skin black quickly have a much higher percentage of para-phenylenediamine than was used in the assay, and most ‘black henna’ temporary tattoos cover a much larger area of skin than a sensitization patch test. Greater and prolonged exposure to an allergen creates greater risk of sensitization. ‘Black henna’ pastes contain 15% to 80% para-phenylenediamine, far more than the 10% patch test. In the few incidents that a large number of people were painted at the same time with the same ‘black henna’, 50% became sensitized to para-phenylenediamine and, by extension, oxidative hair dye.⁴



An artist applies ‘black henna’ to a woman in Darfur.⁵

Muslim and Hindu women have long enjoyed henna body art as part of celebrating weddings, festivals such as Ramadan and Eid al-Adha, Karva Chauth and Diwali, and ‘black henna’ is currently in fashion. ‘Black henna’ is a favorite for weddings in many cultural groups.

People from westernized, industrialized countries enjoy vacation activities normally disallowed during their work year: sleeping late in the morning, eating and drinking too much of delicious things, and relaxing on the beach. These activities include changing one’s appearance on vacation: getting an ornamental braid in one’s hair, wearing ‘not suitable for work’ clothing, and getting a temporary tattoo when a permanent tattoo might reduce their employability.

³ Kligman, A. M. 1966. “The identification of contact allergens by human assay. 3. The maximization test: a procedure for screening and rating contact sensitizers.” *Journal of Investigative Dermatology*, v. 47, issue 5, p. 393-409.

⁴ Star Tribune. July 2, 2011. “Temporary tattoos put blisters on metro kids” *Star Tribune*, Minneapolis, MN, , <http://www.startribune.com/local/124797314.html> accessed December 24, 2011

⁵ Farran, Albert González, March 30, 2013. “El Fasher: (In black dress) Fatama Abaker Bakhit, ‘Tata,’ performs a drawing on Enam Mohammed's foot with "henna."” Uploaded to UNAMID Photo’s Photostream, Flickr.com <http://www.flickr.com/photos/58538810@N03/8730156123/> (accessed November 23, 2013).

Children beg their parents for ‘black henna’ temporary tattoos as vacation souvenirs, as permanent tattooing is forbidden to children. Children love to show off their ‘black henna’ temporary tattoo as it represents being a powerful, rebellious, dangerous adult. The children who have gotten ‘black henna’ on vacation from 1998 to 2015 (using the average age as 10) will see their first gray hair between the years 2018 and 2045. If one hundred people get ‘black henna’ as children and thirty years later purchase oxidative hair dye to cover their gray, fifty of them will have an allergic reaction and twenty of that fifty will have a severe reaction. These twenty people who have extreme reactions to hair dye may require emergency hospitalization as the swelling of the scalp from hair dye application spreads to eyes, ears, mouth and airways. Anaphylaxis reactions to para-phenylenediamine can be fatal.



‘Black henna’ temporary tattoos for sale in Daytona Beach⁶

Every winter and spring school break, and every summer, more people acquire ‘black henna’ temporary tattoos on vacation. Blistering and scarring develops in the area of the pattern three to twenty days after application so the ‘black henna’ artists rarely see the damage they’re doing. The latent severe chemical sensitivities caused by these applications often remain invisible for years, resurfacing when the person began to dye their hair with the same chemical as was in the ‘black henna.’

⁶ Alyson Harris. Photos from Alyson Harris's post in PPD Free Henna Artists. Facebook. June 7, 2013. https://www.facebook.com/photo.php?fbid=10100351029251757&set=gm.644464748915528&type=1&relevant_count=2&theater (accessed September 18, 2013)



Delayed hypersensitivity reaction to para-phenylenediamine following a ‘black henna’ temporary tattoo⁷

People who have been exposed to ‘black henna’ should not be assumed to be sensitized to only para-phenylenediamine; cross sensitizations to other coal tar derivative chemicals in cosmetic and consumer products are common. Toluene-2,5-diamine (PTD) is often substituted in home hair dye kits as a “PPD-free” hair dye. However, about half of people who are allergic to para-phenylenediamine are also allergic to toluene-diamines.⁸



Blistering reaction to ‘black henna’⁹

A blistering reaction to ‘black henna’ will be followed by future allergic reactions from further contact with consumer products containing –diamines and other coal tar derivatives. (See Appendix II for a further list of chemicals.) These sensitizations cannot be reversed or lessened by the passage of time from ‘black henna’ to using oxidative hair dye; sensitizations are life-long. Traditional patch testing may be insufficient to establish sensitization as reactions may

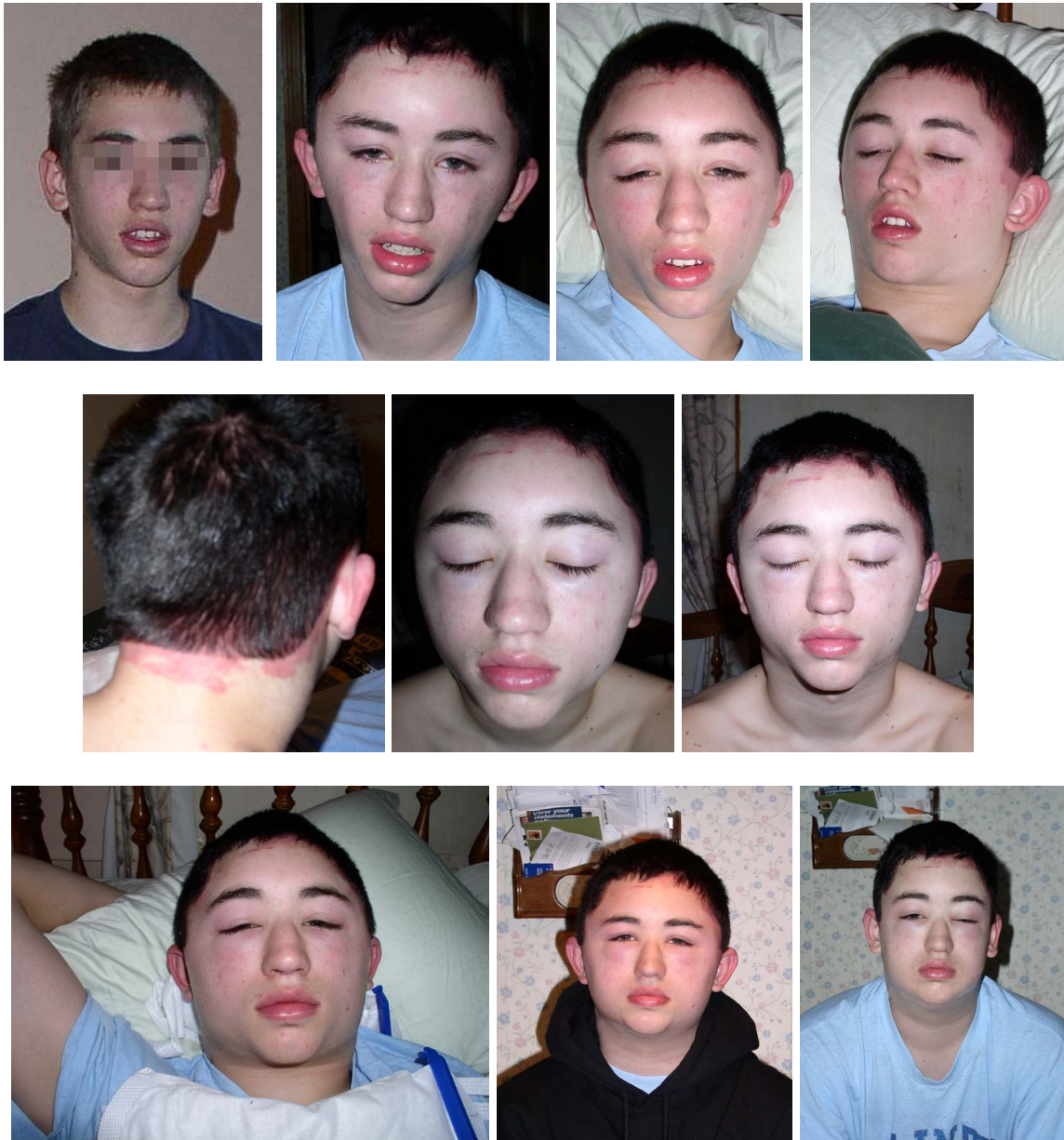
⁷ Spider Girl. Saturday, December 23, 2006. “Spider on the Road, The Henna Incident Saturday, September 10, 2005. WARNING: DO NOT EVER USE BLACK HENNA” blogspot.com <http://spidergirlontheroad.blogspot.com/2006/12/henna-incident.html> (accessed December 19, 2011)

⁸ Ingram, John R., T. Hughes, M., Stone, N. M. 2014. "Potential danger of hair dyes marketed as free from para-phenylenediamine." *International Journal Of Dermatology* **53**, no. 4: e257-e258.

⁹ Kungfu-kickass. Comment, “Acute allergic reaction to henna” posted to WTF/Reddit. March 2013, http://www.reddit.com/r/WTF/comments/1be5to/acute_allergic_reaction_to_henna/ <http://i.imgur.com/UrbXOv.jpg> (accessed November 25, 2013)

occur as late as thirty days after exposure, and patch tests themselves may result in severe reactions.

When this person was twelve years old, he got a 'black henna' temporary tattoo while on vacation in Grand Cayman with his parents. It blistered and itched, but no particular significance was attached to the itching; the pediatrician supplied a soothing cream. He was not advised about a sensitization to oxidative hair dye. When he was sixteen, he asked to dye his hair black on December 30. The next day, he said he felt like someone was pulling his hair out.



As the reaction to oxidative hair dye progressed over the next several days, his head began to swell, his lips began to swell, and his eyes swelled shut. On the second day after hair dye application, he was hospitalized until the swelling could be halted and slowly reduced.

Such a reaction is not unusual, will become more frequent, and many reactions have been and will be far worse. As more people get ‘black henna’ temporary tattoos every vacation season, more people will get severe allergic reactions to oxidative hair dye. See Appendix I for further examples of extreme reactions to the chemicals in oxidative hair dye.



10



11

The chemical beauty industry has downplayed the hair dye risk from the global epidemic of PPD allergy, sometimes by highly selective reading (or misreading) of the literature.¹² For highly sensitized persons, a complete avoidance of all contact with coal-tar derivatives is crucial. New “safer” chemical solutions do not adequately address the problem because they do not take cross-sensitization in to consideration. Exposures to the high PPD content in ‘black henna’ usually creates other sensitivities, just as people who have ‘hay fever’ reactions to one plant pollen often are allergic to other pollens. If a person is sensitized to PPD, they may mistakenly assume that ‘no PPD’ hair dyes are safe for them to use. The different chemical may have a reduced likelihood of allergic reaction, but a reduced likelihood is not the same as ‘no’ likelihood of allergic reaction. Since the FDA doesn’t require cosmetic companies to list the ingredients of professional salon products, a stylist may not have the declaration of ingredients of a product, and may never know whether there is a similar chemical in a hair dye that their client will react to until the onset of the allergic reaction. (See Appendix II for further information on coal-tar derivative chemicals.)

¹⁰ <http://news.softpedia.com/news/Woman-Ends-Up-in-Burns-Unit-After-Allergic-Reaction-to-Hair-Dye-125692.shtml>

¹¹ <http://www.dailymail.co.uk/health/article-2109186/Carmen-Rowe-hair-dye-Pictures-swollen-face-woman-25-allergic-reaction.html#ixzz3oIom4tqN> accessed October 11, 2015

¹² Ingram, John R., T., Hughes, M., and Stone, N., M. (2014) "Potential danger of hair dyes marketed as free from para-Phenylenediamine." *International Journal Of Dermatology* 53, no. 4: e257-e258.

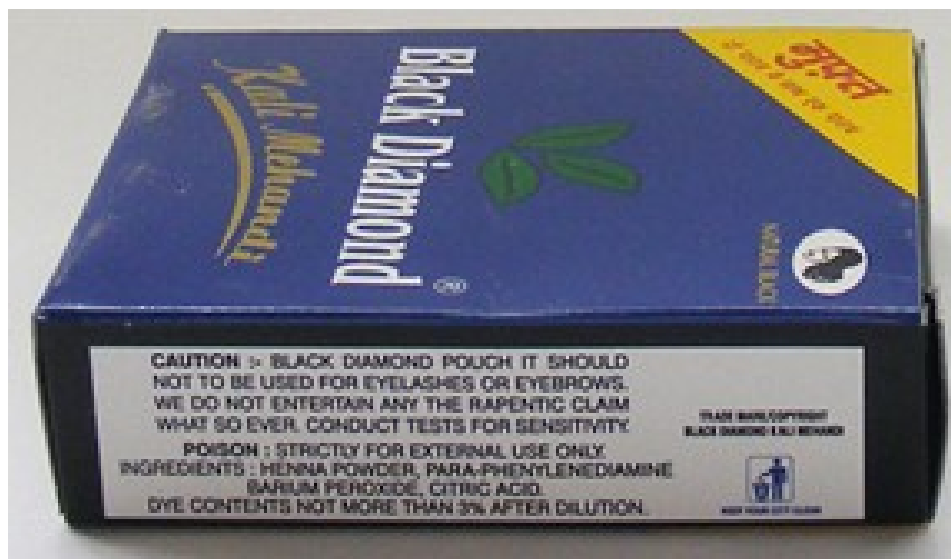


These over-the-counter home hair dyes contain para-phenylenediamine, though their packages show the word 'natural,' plants, fruits, and claim to be gentle and nourishing.

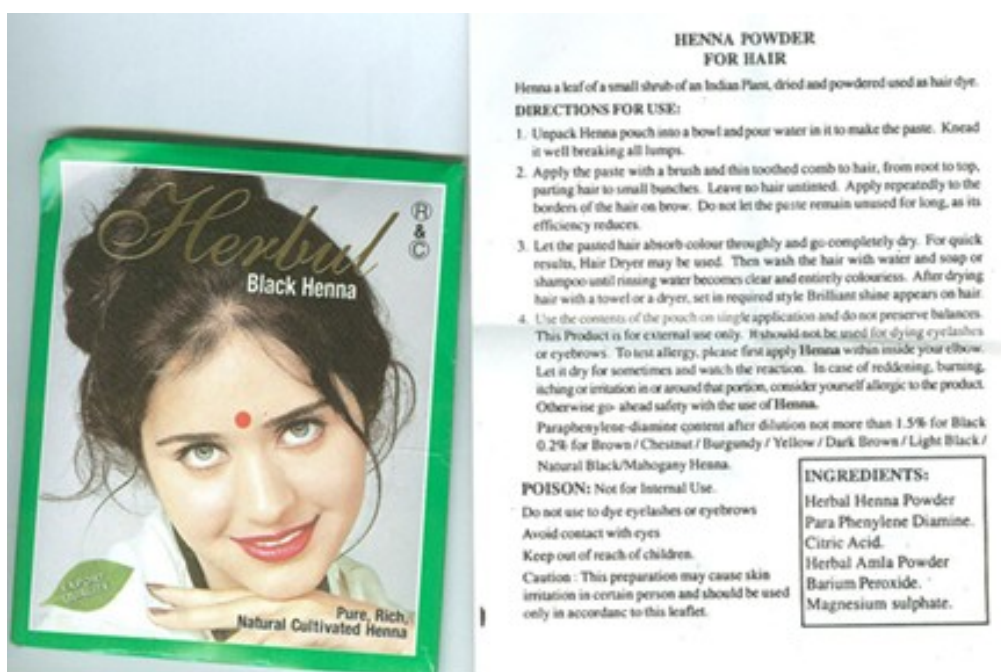


These products, often sold in health food stores, and advertised as being 'herbal' and without ammonia, contain para-phenylenediamine.





Products marketed as henna often contain para-phenylenediamine.



Some products sold as 'henna' contain para-phenylenediamine but have no declaration of ingredients; some have a declaration on the inside of the package. Even when para-phenylenediamine is declared, there is no requirement for listing the percentage of para-phenylenediamine in the powder; it might be 0.1%, or it might be 30%.

.Products for export labeled as 'henna' may not be required to have a complete and precise declaration of contents by the originating countries' governments. As long as there is no

international agreement on what can be sold as ‘henna’, as long as there are no quality standards for henna, and as long as there are no required verifications of ingredient declarations on advertising and packaging of henna, a package of powder marked henna may be anything from benign to useless to lethal. USA importers of these products are not required to ‘discover’ the ingredients; a package imported as ‘henna’ may be sold as ‘henna’ without further investigation into what exactly that product sold as ‘henna’ contains. The only way to be certain what is in a package of ‘henna’ is to send it to an independent certified laboratory. That is exactly what we do for Ancient Sunrise®.

Using Ancient Sunrise® pure henna, indigo, and cassia is one absolutely certain way for maturing people to safely, permanently dye their hair or cover their gray without any coal tar derivatives, additives, or adulterants. Each Ancient Sunrise® shipment of henna, cassia, and indigo is independently laboratory tested for purity and Catherine Cartwright-Jones PhD reviews all the lab results: Ancient Sunrise® *proves* the purity so you know what you’re getting. Independent laboratory testing also ensures that Ancient Sunrise® has no metallic salts, so if a person becomes sensitized to PPD, they can transition to Ancient Sunrise® without waiting for their hair to grow out or risking damage to their hair.

Ancient Sunrise® Henna for Hair Chapter 1, Ancient Sunrise® Henna for Hair

Copyright © 2015 Catherine Cartwright-Jones

Cover Graphic by Alex Morgan

Published by TapDancing Lizard® LLC

339 Tallmadge Rd. Kent, Ohio, 44240

Terms of Service: Creative Commons: Attribution-NonCommercial-NoDerivs 3.0 Unported

You are free to **Share**, to copy and redistribute this material in any medium or format under the following terms. The licensor cannot revoke these freedoms **as long as you follow the license terms**.

Attribution - You must give [appropriate credit](#) and provide a link to the license. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

Non-Commercial - You may not use this material for [commercial purposes](#).

No-Derivatives - If you [remix, transform, or build upon](#) the material, you may not distribute the modified material in any form or by any means.

For further information on henna and hair, please visit www.hennaforhair.com

To purchase henna, please visit www.mehandi.com

HELP DESK AND ORDER DESK: call 330-673-0600 or toll-free 855-MEHANDI