

Could the use of personal care oils in black women contribute to recent findings of an increased risk of breast cancer in this population?



To the Editor: A recent widely publicized study suggested that permanent hair dye use was associated with a 45% increased risk of breast cancer in black women.¹ In white women, permanent dye use only increased the risk of breast cancer by 7%. In addition, it was reported that the use of straighteners, defined as chemical treatments used to permanently or semipermanently straighten or relax hair, was also associated with increased breast cancer risk. Black women who reported any use of straighteners had an 18% increased risk of developing breast cancer. This risk increased with more frequent use, because those who used straighteners every 5 to 8 weeks demonstrated a 31% higher breast cancer risk. The risk associated with straightener use did not vary considerably between ethnic groups.

Interestingly, the researchers did not comment on the use of hair oils in the population they studied. It is widely accepted that black women use natural oils on their hair and body more than other ethnicities.² Many of these natural oils have strong phytoestrogens that have been implicated in a number of adverse health events. There have been multiple case reports of prepubertal male gynecomastia resulting from topical application of lavender and tea tree oils.³ Henley et al⁴ demonstrated that lavender and tea tree oil both demonstrate estrogenic as well as antiandrogenic activities by acting directly on estrogen receptors and acting as androgen receptor antagonists in a dose-dependent manner. These effects have also been suggested in other essential oils and their monoterpene constituents, including citral (a fragrant liquid occurring in citrus and lemongrass oils), geraniol (primary component of rose oil, palmarosa oil, and citronella oil), and neroli oil.⁴

Furthermore, African American women are more likely to use hair products and reach menarche

Table I. List of the most common ingredients listed in the personal care products tested in the Myers et al study^{6*}

Ingredient	Oil hair lotion	Extra dry skin lotion	Intensive skin lotion	Petroleum jelly
Beeswax	X (3/13)			
Caprylic/capric triglyceride		X (5/28)		
Cetyl alcohol		X (3/28)		
Dimethicone		X	X (5/15)	
Glycerin		X (2/28)	X (1/15)	
Glycol stearate			X (4/15)	
Lanolin	X (2/13)			
Mineral oil	X (1/13)	X (1/28)		
Petrolatum	X (4/13)		X (2/15)	X (1/1)
Sodium borate	X (5/13)			
Sorbitol		X (4/28)		
Stearalkonium chloride		X	X (3/15)	
Lye relaxer	Ingredients in the most common formulations of hair relaxers Active ingredient: Sodium hydroxide. Other ingredients: petrolatum, [†] mineral oil, [†] cetearyl alcohol, propylene glycol, polysorbate 60, laneth-15, polyethylene glycol (PEG)-75 lanolin, [†] butyrospermum (shea) butter, <i>Cocos nucifera</i> (coconut) oil, <i>Simmondsia chinensis</i> (jojoba) seed oil, <i>Persea gratissima</i> (avocado) oil, hydrolyzed silk			
No-lye relaxer	Active ingredient: Calcium hydroxide, lithium hydroxide, or potassium hydroxide. Other ingredients: aqua/water, petrolatum, [†] paraffinum liquidum/mineral oil, [†] guanidine carbonate, cetearyl alcohol, behentrimonium methosulfate, polyethylene glycol (PEG)-75 lanolin, [†] polyquaternium-6, cocamidopropyl betaine, parfum/fragrance, butylphenyl methylpropional, propylene glycol, citronellol, geraniol, CI 15510/orange No. 4, succinic acid, denatonium benzoate, silica, titanium dioxide			

*The X denotes the presence of the ingredient and the ratio indicates the rank of that ingredient over the total number of ingredients listed in the product.

[†]Denotes ingredients also found in products in the Myers et al study.⁶

earlier than other racial/ethnic groups. Women who reported childhood hair oil use and those who reported use of perms had an earlier menarche risk ratio of 1.4, suggesting these hair care practices may be linked to endocrine disruption.⁵ Myers et al⁶ studied 8 personal care products commonly used by black women and demonstrated detectable estrogenic activity in 4 of them, including an oil hair lotion, extra dry skin lotion, intensive skin lotion, and petroleum jelly (Table D).

In the most recent study by Eberle et al,¹ the researchers focused on endocrine disrupters in permanent dye and hair straighteners. Here, we suggest that higher rates of phytoestrogen-containing hair and personal care product use in black women adds an additional risk factor that increases the association observed with hair dyes and breast cancer risk demonstrating a double-hit phenomenon. In addition, the use of heat and straighteners likely plays a synergistic role in phytoestrogen exposure because these practices likely enhance product absorption.

In conclusion, the role of phytoestrogens in plant oils needs to be explored further to better understand the discrepancy in breast cancer risk currently being attributed to permanent hair dye and straightener use.

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REFERENCES

1. Eberle C, Sandler DP, Taylor K, White A. Hair dye and chemical straightener use and breast cancer risk in a large population of black and white women. *Int J Cancer*. 2020;147(2):383-391.
2. Tiwary CM, Ward JA. Use of hair products containing hormone or placenta by US military personnel. *J Pediatr Endocrinol Metab*. 2013;1025-1032.
3. Henley DV, Lipson N, Korach K, Bloch C. Prepubertal gynecostasia linked to lavender and tea tree oils. *N Engl J Med*. 2007;356(5):479-485.
4. Howes MJR, Houghton PJ, Barlow DJ, Pocock VJ, Milligan SR. Assessment of estrogenic activity in some common essential oil constituents. *J Pharm Pharmacol*. 2002;54(11):1521-1528.
5. James-Todd T, Terry MB, Rich-Edwards J, et al. Childhood hair product use and earlier age at menarche in a racially diverse study population: a pilot study. *Ann Epidemiol*. 2011;21(6):461-465.
6. Myers S, Yang CZ, Bittner GD, et al. Estrogenic and anti-estrogenic activity of off-the-shelf hair and skin care products. *J Expo Sci Environ Epidemiol*. 2015;25(3):271-277.

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