

# RE: Use of straighteners and other hair products and incident uterine cancer

Mahyar Etminan , PharmD, MSc\*

Department of Ophthalmology and Visual Sciences and Medicine, Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada

\*Correspondence to: Mahyar Etminan, PharmD, MSc, Department of Ophthalmology and Visual Sciences, Faculty of Medicine, The University of British Columbia, The Eye Care Centre, Room 323-2550 Willow Street, Vancouver, BC V5Z 3N9, Canada (e-mail: etminanm@mail.ubc.ca).

I read the study by Chang et al. (1) with interest. Given the amount of concern this paper has generated in the media regarding hair straighteners and uterine cancer, several limitations of this study need to be highlighted.

First, the adjusted hazard ratio for the risk of uterine cancer was stated as 2.78 (95% confidence interval = 1.39 to 5.55), which was based on 14 cases (see Table 4). The mean follow-up among ever users was reported to be 9.79 (SD = 3.28) years. Given the long latency of uterine cancer, a time-lag analysis (2) should have been implemented to exclude cancers that occurred shortly after cohort entry as these cancers are probably not due to straightening products.

Second, residual confounding could also have affected the results. Long-term oral contraceptive uses was reported in 32% of ever users compared with 27% of never users. Moreover, more never users used hormone replacement therapy compared with ever users (27% vs 12.7%). When there are large imbalances in confounder distribution between the exposed and unexposed groups, statistical adjustment might not fully adjust for the confounding effect (3) leading to residual confounding. More robust techniques such as propensity score matching should have been used to better control for confounding bias and ensure the measured confounders are balanced between the 2 groups (3).

Finally, in the study, data on cardiovascular disease were not available, which might subject the study results to confounding by cardiovascular disease (CVD). Death due to CVD is the primary cause of death among women in the United States. Thus, it is possible that differential number of CVD deaths among ever users and never users early during the approximately 10-year follow-up can introduce bias into the study. For example, never users with previous history of severe CVD can die early and subsequently no longer be at risk of developing uterine cancer, whereas users of hair straighteners without CVD with longer follow-up are more likely to develop uterine cancer simply because of living longer.

These limitations need to be considered when examining the results of this study. Future studies that can better control for biases including confounding and disease latency bias are needed to confirm these results.

## Funding

The author received no funding for this work.

## Notes

**Role of the funder:** Not applicable.

**Disclosures:** In the past Dr Etminan has consulted in the Zantac and Valsartan NDMA (N-Nitrosodimethylamine)/Cancer litigations.

**Author contribution:** Writing—original draft; writing—review and editing: ME.

## Data availability

No new data is presented in this letter as this is a letter to a previously published work.

## References

1. Chang C-J, O'Brien KM, Keil AP, et al. Use of straighteners and other hair products and incident uterine cancer. *J Natl Cancer Inst.* 2022;114(12):1636-1645.
2. Suissa S, Azoulay L. Metformin and the risk of cancer: time-related biases in observational studies. *Diabetes Care.* 2012;35(12):2665-2673.
3. Rubin DB. Estimating causal effects from large data sets using propensity scores. *Ann Intern Med.* 1997;127(8 pt 2):757-763. doi:10.1093/jnci/djac165.