No, a Study Did Not Link Hair Color or Dye with Cancer

By Alex Berezow, PhD — September 3, 2020

A study that found basically no link between hair color or dye use and cancer predictably was sensationalized by the media anyway.

A new study published in BMJ examined if there was a link between natural hair color or dye and cancer. A lot of women color their hair, so this is certainly a worthwhile topic.

The authors used data from 117,200 women enrolled in a large epidemiology project known as the Nurses' Health Study. The study enrolled married registered nurses and sent them questionnaires over the years to assess their health. This is the pool from which the authors extracted their data.

Let's cut to the chase and go straight to the conclusion of the paper:
No positive association was found between personal use of permanent hair dye and risk of most cancers and cancer related mortality. The increased risk of basal cell carcinoma, breast cancer (estrogen receptor negative, progesterone receptor negative, hormone receptor negative) and ovarian cancer, and the mixed findings in analyses stratified by natural hair color warrant further investigation.

In other words, there is probably no link between natural hair color or dye use and cancer. Any links are murky and require more research. Basically, there's nothing to see here. But this is how MSN [3] reported the story:

**BESTLIFE**

**Your Hair Color Could Put You at Higher Risk for Cancer, Study Says**

You see, the headline writer added the word "could," so that makes it responsible journalism. [Note: Sarcasm]

The authors of the paper noted that:

"...ever users [of hair dye] did not have an increased risk of most specific cancers (cutaneous squamous cell carcinoma, bladder cancer, melanoma, estrogen receptor positive breast cancer, progesterone receptor positive breast cancer, hormone receptor positive breast cancer, brain cancer, colorectal cancer, kidney cancer, lung cancer, and most of the major subclasses and histological subtypes of hematopoietic cancer) or cancer related death."

The authors found that women who dyed their hair had a slightly increased risk of basal cell carcinoma, a few types of breast cancer, and ovarian cancer. However, they also found that hair dye protected women from brain and lung cancer (though the results weren't quite statistically significant).

Still, that makes absolutely no sense. The only believable explanation for these results is random chance. If you look at enough variables, you'll find something weird by blind luck. That's almost certainly what happened here. (The same is true for their finding that women with naturally dark hair are likelier to get Hodgkin lymphoma. In this subset, they only examined 70 women.)

To the authors' credit, they do not hype their results. They say that more research is needed. It was the media that sensationalized the research.
Update: For information about the chemistry of why hair dye is not carcinogenic, read this excellent article [4] by my colleague Dr. Josh Bloom.


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[5] https://www.bmj.com/content/370/bmj.m2942