

ADMIN

Memo

Agenda

Minutes

Hair Dyes

CIR EXPERT PANEL MEETING

DECEMBER 4-5, 2017

HAIR DYE EPIDEMIOLOGY – through October, 2017

Hair dyes may be broadly grouped into oxidative (permanent) and direct (semi-permanent) dyes. The oxidative dyes consist of precursors mixed with developers to produce color, while direct dyes consist of preformed colors.

Epidemiology studies that seek to determine links, if any, between hair dye use and disease provide broad information and have been considered by the CIR Expert Panel, although these studies do not specifically address the safety of individual hair dye ingredients.

The following provides a brief summary of many relevant epidemiological studies that have been published since about 2010, as well as older epidemiological studies that were included in comprehensive reviews, such as that published by the International Agency for Research on Cancer (IARC) in 2010¹.

Conclusion

The CIR Expert Panel determined that the available hair dye epidemiology data do not provide sufficient evidence for a causal relationship between personal hair dye use and cancer, based on the lack of strength of the associations and inconsistency of the findings. In addition, the Panel noted that there was no consistent pattern of genotype/phenotype influence on hair dye epidemiology findings.

Background

The CIR Expert Panel reviews new epidemiological studies addressing the personal use of hair dyes as these studies become available. Table 1 summarizes the studies specifically addressing bladder cancer, lymphoma, and leukemia and breast cancer. Relevant meta-analytical studies included here address glioma and breast cancer, in addition to bladder and blood cancers. Occupation as a hairdresser, barber, or cosmetologist involves exposures to multiple products used during work, making it difficult to use the results of such studies to inform the assessment of the risk, if any, associated specifically with hair dyes. Accordingly, such studies are not summarized here.

The CIR Expert Panel considers that epidemiological studies, based on better information about exposure, can provide more useful findings than other such studies. Rollison et al. (2006) noted that exposure assessments in hair dye epidemiology studies ranged from minimal information (e.g., ever/never use) to subject-recalled information on type, color, duration and frequency of use.² These authors developed a scale from + to ++++ to score the quality of hair dye exposure assessments in hair dye epidemiology studies. This scale was used to score the studies that are summarized in Table 1.

An IARC working group summarized the relevant epidemiology studies and observations on breast, bladder and hematological cancers.^{1,3} The working group concluded that the data are of insufficient quality, consistency, or statistical power to establish the presence or absence of a causal link between personal use of hair dyes and cancer. They also concluded that the animal studies provided limited evidence for the carcinogenicity of hair colorants. Occupational exposure during work as a hairdresser, barber, or beautician was also assessed. The working group found that exposures from these occupations are probably carcinogenic, based on limited evidence of increased risk for bladder cancer in hair dressers and barbers.

The studies herein result in either an odds ratio or a relative risk, two similar but not synonymous terms. An odds ratio (OR) represents the odds that an outcome (e.g. cancer) will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure; whereas a relative risk (RR) is a measure of the risk of a certain event happening in one group compared to the risk of the same event happening in another group.^{4,5} In cancer research, ORs are most often used in case-control (backward looking) studies, and RRs are used in prospective (forward looking) studies, such as cohort studies and clinical trials. An OR of 1 means that an exposure does not affect the odds of an outcome (i.e. does not increase the risk of cancer), while a RR of 1 means there is no difference between two groups in terms of risk following a particular exposure. However, either an OR or RR > 1 means the exposure may increase the risk of disease.

