Public Citizen
Congress Watch • Critical Mass Energy Project • Health Research Group • Litigation Group • Tax Reform Group

Comments of Sidney M. Wolfe, M.D.

Director of Public Citizen Health Research Group

on

H.H.S. Report of the Color Additive Scientific Review

Panel on Carcinogens In Food Drug & Cosmetic Dyes

August 15, 1985

INTRODUCTION

These comments are in response to a request from Dr. Ronald Hart, Chairman of the above panel to review the 130 page document (above H.S.S. Report).

The two sections of my comments will be as follows:

I. Is quantitative risk assessment for carcinogenic Food, Drug & Cosmetic Dyes appropriate or legal?

II. What are the major flaws in the H.H.S. Report's conclusions on the risks of the six dyes (Food Drug & Cosmetic (F.D.&C.) Red 3, D & C Reds 8,9,19 & 37 & D & C Orange 17.) all of which are acknowledged to be carcinogens.

I. Is quantitative risk assessment for carcinogenic Food, Drug & Cosmetic Dyes appropriate or legal?

Because Dr. Hart requested that comments be confined to "the scientific aspects of the risk assessments" and since our challenge to the legality of FDA's failure to ban these 6 dyes is the subject of an ongoing legal proceeding (Public Citizen vs. H.H.S.) my comments here will be brief. The Delaney Clause for Color Additives clearly states that once a dye has been found to be carcinogenic in proper tests, it can no longer be allowed on the market. Furthermore, FDA scientists and the HHS Review Panel agree that all six of these dyes are carcinogens. Therefore, they should have been banned. Since risk assessment (other than is it a carcinogen or not) was never contemplated by those who passed the Delaney Clause it can only be viewed as a delaying tactic, an illegal one at that.

II. What are the major flaws in the HHS Report's conclusions on the risks of the six dyes?

a. Ranking the ease and the validity of quantitative risk assessments based on various kinds of carcinogenicity data.

1. Human epidemiologic data: The most valid kind of risk assessment is based on retrospective studies (cohort or case-control) of human populations exposed to known amounts of alleged carcinogens (or other toxins). Thus, risk assessments for benzene, benzidine, beta naphthylamine, asbestos, estrogens and other substances proceed from knowing that people were exposed to certain chemicals, that a certain fraction got cancer, and that others exposed to these same chemicals are also going to get various amounts of cancer depending on the duration and intensity of their exposure.

2. Animal carcinogenicity studies using substances of known composition with known degrees of exposure: A variety of substances, including pesticides, food additives such as saccharrin, drugs such as cancer treatment drugs, workplace chemicals such as formaldehyde, carbon tetrachlorides, vinyl chloride and others have been found to be carcinogens in properly conducted animal studies. The composition of these chemicals was known, the rates of absorption, inhalation/ingestion could be calculated, and because it was clear in each instance that the substance (or a metabolite), not an impurity, was the carcinogen, quantitative risk assessment could be done, although it is not quite as valid as that based on human epidemiological studies.

3. Animal carcinogenicity studies using substances of unknown composition, with unknown degrees of potency and unknown extents of exposure to often unidentified impurities. "Quantitative risk assessment" based on studies such as those done on these six dyes--is an art masquerading as science. All that can be concluded from such studies is that a crude mixture of chemicals, some known (such as the one which makes the substance red or orange), many unknown, does or does not cause cancer. Of the three different types of quantitative risk assessments discussed here, this is the least valid or, more bluntly, the one which is invalid.

b. Why is quantitative risk assessment based on studies using complex mixtures such as these six dyes very risky?

1. The composition of the dyes is unknown.

According to the Report of the Color Additive Scientific Review Panel (hereafter, "Panel Report") "The methods for (FDA dye) certification are generally not rigorous, and do not fully characterize the purity of the color, as a percent of the color additive, or the amounts and varieties of impurities that may be present, including subsidiary colors, side reactions during synthesis, and possible degradation products. (Panel Report, page 3) The report details such problems for each of the six dyes.

2. It is not known which component(s) of the dye are carcinogenic or mutagenic, since all components have not been determined nor, therefore, is the potency of these components known. According to FDA Center for Food Safety & Applied Nutrition Director Dr. Sanford Miller "these substances are manufactured from substances that are carcinogens. Furthermore, color additives are known to contain carcinogens that differ in potency by more than 100,000 fold....(other) carcinogenic components are still unknown" (pp. 11 & 12. Memo to FDA Commissioner Young, Nov. 23, 1984)

3. The rate of absorption is unknown via the skin or by ingestion of these often unidentified components of the crude mixes called "certified colors". According to the above mentioned memo by Dr. Miller, "the rate of absorption through the gut is still unknown, and the rate of penetration of those components through the skin is still unknown. The assertion that skin penetration and absorption through the gut are the same for all components is not supportable. As a consequence, we do not know either the exposure to the carcinogens or their potency." (11/23 memo, pages 11&12)

4. There is wide variation from person to person in the rate of metabolism of chemicals according to the Panel Report (page 12 & 13) "since the activities of the cytochromes P450 that metabolize benzo (a) pyrene in human placenta can vary by over 400 fold in different individuals." Thus, especially because these dye components are unknown, this human variation is another problem with quantitative risk assessment.

c. The maximum tolerated dose (MTD) was not achieved for several of the animal carcinogenicity experiments. As noted in a number of places in the Panel Report under the sections on toxicology, the MTD was not achieved. Thus, it is possible that for this reason, the risk was underestimated.

SUMMARY

For all of the above reasons, the use of quantitative risk assessment--to determine how much risk humans face from the use of these dyes based on data from animal carcinogenicity studies--is an unscientific and a potentially dangerous exercise. My greatest concern is that the risk will be underestimated. Using the flawed assumptions and unknowns that were employed by the industry (the Cosmetic Toiletry & Fragrance Association) & somewhat rubber-stamped by the Panel Report in making their risk estimates), the seemingly "small" risks to humans could actually be 100 or 1000 times higher than calculated. According to FDA's Dr. Sanford Miller, "because its assumptions are not supported, CTFA's upper bound risk assessments could be hundreds or even thousands of times too low." (11/23 memo, page 12)

Thus, for example, the lifetime ingestion of tiny amounts of lipstick (less than 1/1000 of a gram per day), is said to be accompanied by a risk of only 5.1 X 10-6 of cancer. This amounts to 5 cases of cancer out of 1 million women so exposed. But if the industry calculations are too low, as Dr. Miller suggests they might be, the risk would be 100 or 1000 times higher. Thus, instead of 5 cases of cancer out of 1 million, using lipstick with Red 9, there could be 500 cases or even 5000 cases out of a million . (This equals one case of cancer per 200 women.) It is for this kind of reason, among many others, that the use of quantitative risk assessment for these dyes must be rejected.