

Chemical Risk Factors of Primary Liver Cancer: A Short Comment [Letter]

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Dear editor

I have read with interest the article “Chemical Risk Factors of Primary Liver Cancer: An Update”.¹ I appreciate the authors for this brilliant work.

The article has discussed the International Agency for Research on Cancer (IARC) identified chemicals related to medications, lifestyle and occupational exposure, which can potentially cause hepatocellular carcinoma (HCC). I suggest adding a few more such chemicals related to occupational exposure.

4-Aminobiphenyl (4-ABP) is classified as Group 1 carcinogen in humans. It was formerly used in the rubber and dye industry, now used as carcinogen in mutagenicity study and cancer research. Occupational exposure to 4-ABP can occur via 4-ABP contaminated products or benzidine and benzidine-based dyes which yield 4-ABP on metabolism. Its metabolism results in a mutagen, N-hydroxyl ABP formation. It can form DNA adducts. Its ingestion in rats results in bladder cancer, angiosarcoma and HCC.² It has been associated with bladder cancer in workers exposed to it. Increased 4-ABP DNA levels were observed in HCC patients than controls.³

4,4'-Methylene bis (2-chlorobenzenamine) (MOCA) is also an IARC Group 1 agent. It is used for polyurethane prepolymers in the manufacture of castable urethane rubber products and as a model compound to study carcinogens. Workers can be exposed during its production and use in the polyurethane industry mainly via dermal contact. It interacts with DNA and haemoglobin to form adducts. In vivo studies indicate risk of lung and mammary gland adenocarcinoma, and HCC. Bladder cancer risk has been identified in workers exposed to it.²

Ortho-Toluidine (o-toluidine) is used for production of herbicides, such as metolachlor and acetochlor, dyes and pigments, rubber, pharmaceuticals and other chemicals. In the laboratory it is used for glucose analysis and tissue staining. Occupational exposure can occur while manufacturing these products. Laboratory staff may be exposed while staining tissues. Epidemiological studies show significant association between its exposure and human bladder cancer.² Oral administration in rats causes increased risk of HCC. There is sufficient evidence for its carcinogenicity in humans and animals (Group 1).²

Benzidine and dyes metabolized to it are Group 1 carcinogens. Benzidine is used in dye production to color textiles, leather, and paper products and in the petroleum, rubber, plastics, wood, soap, fur, and hair-dye industries.² Workers can be exposed during its production or use of products containing it. Although no evidence of human cancer due to its exposure, it has been shown to increase HCC in rats.⁴

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Mentioning these compounds would allow further research to find association between them and human cancer and further awareness for people at risk.

Disclosure

The author reports no conflicts of interest in this communication.

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