

Biochemical and molecular aspects of 1,2-dimethylhydrazine (DMH)-induced colon carcinogenesis: a review

ABSTRACT

1,2-dimethylhydrazine (DMH) is a member in the class of hydrazines, strong DNA alkylating agent, naturally present in cycads. DMH is widely used as a carcinogen to induce colon cancer in animal models. Exploration of DMH-induced colon carcinogenesis in rodent models provides the knowledge to perceive the biochemical, molecular, and histological mechanisms of different stages of colon carcinogenesis. The procarcinogen DMH, after a series of metabolic reactions, finally reaches the colon, there produces the ultimate carcinogen and reactive oxygen species (ROS), which further alkylate the DNA and initiate the development of colon carcinogenesis. The preneoplastic lesions and histopathological observations of DMH-induced colon tumors may provide typical understanding about the disease in rodents and humans. In addition, this review discusses about the action of biotransformation and antioxidant enzymes involved in DMH intoxication. This understanding is essential to accurately identify and interpret alterations that occur in the colonic mucosa when evaluating natural or pharmacological compounds in DMH-induced animal colon carcinogenesis.

Keyword: Colon cancer; DMH; Preneoplastic lesions; Chemoprevention