

TOXICOPATHOLOGIC EFFECTS OF AFLATOXIN B₁ (AFB₁) AND
DICHLORODIPHENYLTRICHLOROETHANE (DDT) IN RAT LIVER

PANISA KHOTCHAPOOM

TOXICOPATHOLOGY RESEARCH LABORATORY,
DEPARTMENT OF PATHOBIOLOGY, FACULTY OF SCIENCE,
MAHIDOL UNIVERSITY, RAMA 6 ROAD
BANGKOK 10400, THAILAND

Abstract

In experiment A, we studied on the P.O. sensitivity of 2 mg-kg⁻¹ AFB₁ administration in Buffalo and Wistar rats, for a period of 6 weeks. Precancerous lesions of hepatocellular carcinoma developed in 0% and 37% of Buffalo and Wistar rats, respectively. We could conclude from this experiment that Wistar strain appears more susceptible to hepatocarcinogenesis induced by AFB₁ than Buffalo strain.

In experiment B, we studied the effect of dietary dichlorodiphenyltrichloroethane (DDT) in rats fed AFB₁. Seventy-four and sixty-one of young and aged male Wistar rats were divided into 4 groups: Group 1, receiving the semisynthetic diet; group 2, AFB₁ 4 ppm; group 3, DDT 500 ppm; and group 4, AFB₁ 4 ppm/DDT 500 ppm. All special diet and water were given ad libitum continuously for 24 weeks and then replaced with Chow pellets for 8 weeks.

There was no significant change in serum transaminase enzymes activities and serum total protein. On the contrary, serum albumin was decreased in AFB₁ treated animals. Markedly enlarged liver with dark red color was found after week 12 in the animals receiving DDT alone and AFB₁ followed by DDT. Foci of cellular alteration which consisted of an acidophilic and basophilic clear cell lesions were seen in the liver of AFB₁ treated rats (both groups 2 and 4) examined by light microscopy. The tumors were more prominent in the livers of young and aged animals given AFB₁ followed by DDT i.e. 57% and 33% at week 32, respectively. Hepatocellular carcinomas of trabecular type, also developed in 33% and 0% of young and aged animals fed AFB₁ alone. These results suggest that the DDT potentiates hepatocarcinogenesis induced by AFB₁ in rats and young animals were more susceptible to liver tumor induction than the aged animals.