Effect of DDT (2,2-bis-p-chlorophenyl-1,1,1-trichloroethane) on Pentobarbitone (PB) Anesthesia in Rats

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Occupational exposure to dichloro-diphenyl trichloroethane (DDT) (2,2,bis-p-chlorophenyl 1,1,1-trichloroethane) occurs during public health operations against pests and malaria. Health impairment upon application manifests in neurological and myopathic disorders. Chronic exposure to DDT shortens anesthesia induced by pentobarbitone (PB) in rats. In this study, the effects of a single dose of DDT (20 mg/Kg i.p., 60 min pre-PB), on the onset and duration of PB-induced (35 mg/Kg ip) anesthesia in Charles Foster male rats with matching controls were observed. PB induced anesthesia in controls (n = 6) treated with the vehicle (olive oil) for a period of 201.75 ± 11.7 min. but only 32.37 ± 9.40 min in DDT-administered rats. DDT significantly (p < 0.01) attenuated the PB anesthetic effect but showed non-significant variation in the onset of anesthesia due to the slow DDT entry across the gut (during po) and then central nervous system (CNS) potentiation enhancing cholinergic activity or stimulating cytochrome p-450 action. Thus an acute DDT dose shortens PB-induced anesthesia, whereas a chronic oral DDT exposure induced proliferation of liver microsomes facilitating detoxification.