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Solvent inhalants remarkably alter brain neurotransmitter

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Solvent inhalant abuse is widely spread allover the world; especially among adolescents. Solvent inhalants were found to be highly toxic and extremely deleterious to the addicts' health and societies. Numerous studies were undertaken to investigate the neurophysiologic and biochemical mechanisms through which these substances produce their toxicity. This study was devoted to investigate the effect of Toluene on brain neurotransmitters after its single and repeated inhalation in rats.

Levels of Glutamate, GABA, dopamine and 5 HT were measured in rat's brain homogenate after single and repeated daily inhalation of Toluene in 2 concentrations.

Results revealed that Toluene significantly ($P<0.01$) increase the level of glutamate of in rat's brain in a concentration-dependent manner. Besides, single and repeated daily inhalation of the two concentrations of Toluene significantly decreased GABA level in rat's brain. Single inhalation of Toluene also increased 5-HT level in rat brain, but this increase was insignificant compared to the control group. However, repeated daily inhalation of the two concentrations of Toluene in both concentrations significantly increased 5-HT level in rat brain. Both single and repeated daily inhalation of the two concentrations of Toluene also significantly increased dopamine level in rat's brain.

Therefore, single and daily repeated Toluene inhalation significantly alter levels of brain neurotransmitters. Toluene increases levels of glutamate; the "excitatory" neurotransmitter; and decreases levels of GABA; the "inhibitory" neurotransmitter. Toluene single and repeated daily inhalation increases 5-HT and dopamine levels in rat's brain. These results could explain the various behavioral changes induced by inhalation of this toxic solvent inhalant.

Biography

Elkoussi is a professor of Pharmacology and Toxicology in Assiut College of Medicine. He obtained his PhD in 1972 and in 1982 and 1984 was granted postdoctoral fellowships in the University of Florida College of Pharmacy. From 1990 to 1994 he worked as a Senior Research Scientist in the Center for Drug Design and Delivery and Center for Drug Discovery, University of Florida and also worked as pharmacologist and as a regulatory affairs manager in pharmaceutical research companies in USA and Egypt. In 2002 Prof. Elkoussi obtained a Hubert Humphrey Fellowship at Johns Hopkins University.

He published over 50 manuscripts in international journals and presented several lectures and research work in many international conferences and supervised several Masters and PhD theses in experimental and clinical pharmacology and toxicology.

Prof. Elkoussi main areas of interest includes: drug abuse, drug design &delivery, drug interactions, biological evaluation of drug activity, pharmacokinetics, pharmacotherapy, pharmacovigilance as well as phytotherapy.

For the last 2 decades; Prof. Elkoussi has conducted and supervised several research studies and projects on the topic of solvent inhalant abuse; causes, patterns and significance in different countries.

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