

Tetrahydroisoquinolines (TIQs), Acetaldehyde, and Alcoholism

In alcoholics, acetaldehyde encrusted neurotransmitters have been found to bind with opiate receptors in the brain, signaling it to stop producing endorphins. As the natural endorphin supply declines, more and more alcohol is required to produce more TIQs to displace the natural endorphins and bind with opiate receptors to create feelings of well-being. In the initial biochemical reaction, the alcoholic's liver produces acetaldehyde at an accelerated rate, so much so that the effect is that the liver is bombarded with twice the amount it is capable of immediately processing. The excess acetaldehyde is dumped into the bloodstream and, traveling to the brain is condensed with dopamine into TIQs. This process is repeated every time an alcoholic takes a drink.

Slowly but surely, he or she builds up a growing cache of TIQs in the reward centers of the brain, eventually accumulating sufficient quantities to cause an irresistible craving for alcohol. Once that level is reached, the powerful cravings cannot be ignored, and he or she inevitably crosses over into a dark, shadowy world in which they no longer have control over drinking, and become powerless over alcohol.

At the University of Texas Health Sciences Center at San Antonio, Dr. Kenneth Blum found that reducing acetaldehyde levels may reduce cravings that can lead to alcoholism.

Beta-Carbolines and Tetrahydroisoquinolines

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TIQs BLOCK THE DEVELOPMENT OF ENVIRONMENT DEPENDENT TOLERANCE TO ETHANOL

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There is ample evidence that TIQs interact with various behaviors related to the effects of ethanol. For example, the hypnotic effect of an acute dose of ethanol can be enhanced by prior treatment with TIQs (Marshall, Hirst 1976; Melchior 1980), ethanol withdrawal can be exacerbated by certain TIQs (Blum, et al.1976), and preference for ethanol can be influenced by these compounds (Melchior, Myers 1977; Myers, Melchior 1977; Myers, Oblinger 1977; Duncan, Deitrich 1980). However, the possibility that TIQs

As previously reported (Melchior, Tabakoff 1981a), animals injected with CSF became tolerant to ethanol.

Recently, several investigators have demonstrated that ethanol for the first time (Table 2). In contrast, the TIQ-treated animals do not show a drop in ethanol level. In fact, the level of ethanol in the brain of TIQ-treated animals is greater on Day 5 than on the first day they receive ethanol.

with the effects of the drug. This leads to the develop-

Another important feature of these experiments should not be overlooked. A single intraventricular injection of either THP or CSAL influenced behavioral responses measured many days later. This provides further evidence that TIQs have long-term effects and, thus, supports the suggestion that they may act as neurotoxins.