

THE NEUROBIOLOGICAL BASIS OF POLY-DRUGS USE

Felice Nava

Department of Addiction Medicine – U.L.S.S. n. 8 del Veneto - Hospital of Castelfranco Veneto, Treviso, Italy

In the last years the poly-drugs use is growing in addicts. Today, the polydrug addiction is a “street phenomenon” largely unknown (Leri et al., 2003). In fact, the neurobiological basis of poly-drug abuse is, for the most part, yet undefined. Although all drugs of abuse are able to activate the mesolimbic dopaminergic system, they are able to affect the rewarding system with different mechanisms of action (Di Chiara, 1995). The simultaneous administration of different drugs of abuse such as alcohol, cocaine, heroin, ect. is able to induce peculiar and complex clinical conditions with the activation of several neurobiological substrates. For example, the concomitant administration of alcohol and cocaine is able to produce a particular metabolite called cocaethylene able to strongly activate the rewarding system (Pennings et al., 2002). Indeed, several evidence suggests that the co-administration of different drugs of abuse is able to induce peculiar changes in neurotransmission. While a single administration of heroin is able to induce a strong reduction of noradrenergic and glutamatergic neurotransmission and a single dose of cocaine is able to activate the previous brain pathways, we do not know the eventual peculiar neurobiological changes induced by the simultaneous administration of the two drugs. More complex are the pharmacological interactions in drug addicts with different patterns of abuse able to induce cross-tolerance, sensitization, or intoxication and withdrawal states. Finally, more obscure are the neurobiological basis of the poly-drugs use in individuals with different personality traits and temperaments. In fact, several recent evidence suggests that there are genetically and environmentally determined characteristics that comprise a shared or common vulnerability to abuse a range of illicit drugs (Tsuang et al., 1998). The impact of poly-drugs use on health and social function in addicts is still poorly understood and further studies are necessary to investigate this specific area.

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