The Neuropsychopharmacology and Toxicology of 3,4-methylenedioxy-N-ethyl-amphetamine (MDEA)

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Keywords: Amphetamine derivatives — Amphetamine toxicity — Ecstasy — Eve — MDE — MDEA — MDMA — RSA — Street drugs.

ABSTRACT

This paper reviews the pharmacology and toxicology of 3,4-methylenedioxy-N-ethyl-amphetamine (MDEA, “eve”). MDEA is a ring-substituted amphetamine (RSA) like MDMA, its well known N-methyl analog. Both have become very popular substances of abuse in the techno- and house-music scene. They can evoke psychomotor stimulation, mild alterations of perception, sensations of closeness and a positive emotional state as well as sympathomimetic physical effects. At present, the name “ecstasy” is no longer used only for MDMA, but for the whole group of RSAs (MDA, MDMA, MDEA and MBDB) as they are chemically and pharmacologically nearly identical; moreover, many ecstasy pills contain mixtures of the RSAs. Hence, for a selective review on MDEA, it is crucial to strictly differentiate between: 1) street and chemical names, and 2) studies with or without chemically defined substances. In order to present MDEA-specific information, the pharmacodynamics and kinetics are described on the basis of MDEA challenge studies in animals and humans. In the toxicology section, we present a collection of case reports on fatalities where MDEA was toxicologically confirmed. On the question of serotonergic neurotoxicity and possible long-term consequences, however, MDEA-specific information is available from animal studies only. The neurotoxic potential of MDEA in humans is difficult to estimate, as ecstasy users do not consume pure substances. For future research, challenge studies in animals using dosing regimens adapted to human consumption patterns are needed. Such challenge studies should directly compare individual RSAs. They will represent the most viable and fruitful approach to the resolution of the highly controversial issues of serotonergic neurotoxicity and its functional consequences.

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