Amphetamine, alcohol and cocaine: PET/[^{11}C]raclopride and dopamine depletion studies in humans

Leyton M
Department of Psychiatry, McGill University, Montreal, Quebec, Canada

An extensive animal literature suggests that drug-induced increases in dopamine (DA) transmission are closely related to their rewarding properties. In humans, though, the evidence is less clear. Few substances have been tested for their ability to increase extracellular DA levels, and DA antagonists do not consistently decrease subjective effects of stimulant drugs or drug use during clinical trials. Given these discrepancies, we have recently initiated studies using two approaches. First, we have been measuring the ability of abused drugs, across pharmacological classes, to increase extracellular DA levels in human striatum. Second, we are investigating whether diminishing the ability of drugs to increase DA transmission alters drug craving, drug "high," or drug self-administration. The former studies use the PET/[^{11}C]raclopride method, the latter use acute phenylalanine/tyrosine depletion. Preliminary studies suggest that drugs of abuse increase striatal DA release with preferential effects in limbic striatum. Individual differences in these drug effects might be related to pre-existing personality traits. DA depletion can decrease drug craving and self-administration, but this may vary with the subject population; *e.g.,* occasional users *vs.* substance abusers *vs.* the chronically dependent.
Supported by the Canadian Institutes of Health Research (CIHR)

Marco Leyton, Department of Psychiatry, McGill University, 1033 Pine Avenue West.
Montreal, Quebec H3A 1A1, Canada, e-mail marco.leyton@mcgill.ca

session 44