

Dopamine abnormalities linked to violence

A new study adds to evidence that abnormalities in the brain's use of the neurotransmitter dopamine play a role in violent behavior.

Using SPET (single-photon emission tomography), Jyrki Kuikka and colleagues compared striatal dopamine transporter (DAT) density in 21 impulsive violent offenders, 10 non-violent alcoholics, and 21 control subjects. A higher DAT density, they note, indicates increased overall dopamine transmission. (The researchers compared their violent subjects to non-violent alcoholics in order to control for the effects of alcohol abuse, which was reported by all of the violent subjects.)

The researchers found that compared to the other two groups, violent offenders had a high DAT density and a "spotty" DAT distribution. These abnormalities, the researchers say, "may be associated with overactive and miscontrolled dopaminergic transmission." Nonviolent alcoholics, in contrast, had significantly lower DAT densities than control subjects.

In addition, Kuikka et al. note, young violent offenders did not exhibit normal left-right asymmetry in DAT distribution, while scans of older violent offenders revealed a more normal distribution. This late normalization of asymmetry, the researchers say, "may reflect late neurobiological maturation among habitually violent offenders."

The researchers say their findings are consistent with animal studies that suggest an association between aggression and increased dopamine activity in the brain.

"Abnormal structure of human striatal dopamine re-uptake sites in habitually violent alcoholic offenders: a fractal analysis," Jyrki T. Kuikka, Jari Tiihonen, Kim A. Bergström, Jari Karhu, Pirkko Räsänen, and Markku Eronen, *Neuroscience Letters*, Vol. 253, 1998, pp. 195-197. Address: Jyrki T. Kuikka, University of Oulu, Oulu, Finland, jkuikka@uku.fi.