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Center for Behavioral Health Studies

Varying Dopamine Levels Can Change Smoking Behavior

National Institute on Drug Abuse (NIDA) **researchers have demonstrated that lowering and raising the concentration of dopamine in the brain changes smoking behavior.** After taking a chemical compound that blocks release of dopamine to the brain's pleasure center, smokers lit up sooner and smoked more cigarettes than they did after taking a compound that stimulates dopamine release.

Impact of Varying Dopamine Levels

Nicotine triggers the release of dopamine in the brain. The resulting pleasurable sensations are thought to be a major driving force in establishing addiction.

Studies of animals in which brain cells were analyzed after nicotine administration, confirm the link between dopamine and addictive behavior. This research demonstrates that an individual's smoking behavior can be manipulated by stimulating or blocking dopamine release.

Haloperidol is also used to treat some psychiatric disorders. Earlier studies have found that patients with schizophrenia smoked more during treatment with haloperidol than when they were not taking the anti-psychotic medication.

Other studies have shown decreased smoking and craving for nicotine among smokers who received bromocriptine. This drug is used to treat Parkinson's disease and disorders of the pituitary gland.

Study Design

This study was designed to use oral doses of either haloperidol or bromocriptine because these compounds can be used to decrease or increase availability of dopamine in a group of smokers. Researchers can use these drugs in evaluating their effect on smoking behavior.

Participants in the study (14 men, 6 women, average age 30 years) smoked 15 or more cigarettes per day for at least 2 years. On average, they had been smoking more than 12 years and smoked 20 cigarettes per day at the time of the study.

All participants received both haloperidol and bromocriptine during the course of the study, which consisted of two 5-hour sessions spaced roughly a week apart.

In their first session, the participants received an oral dose of haloperidol or bro-

Smoking Behavior Changes With Decrease Or Increase of Dopamine

	Haloperidol (inhibits dopamine)	Bromocriptine (enhances dopamine)
Total number of cigarettes smoked	3.0	2.3
Total puffing time (seconds)	77.6	52.0
Number of puffs taken	44.8	31.1
Time between cigarettes (minutes)	32.1	41.2

mocriptine. In their second session, the participants received the other drug. Over the next 5 hours, the participants were allowed to smoke their preferred brand of cigarettes at will. They also answered questions about craving and discomfort.

Summary

With bromocriptine, participants smoked less cigarettes per session and smoked them slower than they did with haloperidol. Participants also reported less craving with the use of bromocriptine.

Research has clearly shown that smoking behavior can be manipulated by alternately blocking or stimulating dopamine production in the body.

This suggests the importance of dopamine's impact on smoking, according to Mona Sumner, Chief Operations Officer for Rimrock Foundation. **"The results seen offer additional support for potential medications that can help control smoking."**

Center for Behavioral Health Studies

Rimrock Foundation
P.O. Box 30374
Billings, MT 59107

For further information on Rimrock Foundation's treatment of Nicotine Addiction, call Jen Porter, Admissions Supervisor at 1-800-227-3953 or 1-406-248-3175, or visit our Web site at www.rimrock.org. For more educational information on Nicotine Addiction, contact the Rimrock Foundation Library at the above numbers.