

SOUTHWESTERN NEWS

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COCAINE ABUSE IN WARM ENVIRONMENTS IMPAIRS BODY'S PERCEPTION OF HEAT, ABILITY TO SWEAT – AND CAN BE LETHAL

DALLAS – June 4, 2002 – Cocaine, even in small amounts, can be fatal when taken in warm environments, such as hot weather, crowded nightclubs or rave parties – all-night dance parties where illicit cocaine use is common – according to researchers at UT Southwestern Medical Center at Dallas.

The researchers discovered that cocaine elevates body temperature by impairing the body's ability to increase skin-blood flow, to sweat and to perceive excessive heat stress. The findings appear in today's issue of *Annals of Internal Medicine*.

"Individuals who abuse cocaine, especially in hot temperatures while participating in recreational sports or attending rave parties, won't perceive that they are hot and are, therefore, less likely to drink water or to find cooler conditions," said Dr. Craig Crandall, assistant professor of internal medicine and lead author of the study. "The hyperthermic effects of cocaine are greatly amplified when the drug is used under these conditions.

"This may result in serious heat-related injuries, including heat cramps, heat exhaustion, heat stroke and ultimately death," added Crandall, who is also a research scientist at the Institute for Exercise and Environmental Medicine, a joint venture between UT Southwestern and Presbyterian Hospital of Dallas.

Crandall and his collaborators studied the mechanism of cocaine-induced hyperthermia in seven volunteers who had never used cocaine. The researchers compared the effects of a small dose of cocaine dissolved in saline solution and a placebo. Both were applied to the inside of the nose of each of the study volunteers in separate trials. The researchers measured esophageal temperature, skin-blood flow, sweat rate and perceived thermal sensation.

Approximately 25 million Americans have tried cocaine, which is a major cause of life-

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threatening cardiovascular emergencies, including hypertensive crisis, acute myocardial infarction and ventricular arrhythmias. Cocaine is the most frequent cause of drug-related deaths reported by medical examiners, and it is the most commonly used illegal drug among people seeking care in hospital emergency departments or drug treatment centers.

“The lethal effect of cocaine is unique among those of other illicit drugs because it is related not only to dose but also to the drug’s tendency to cause hyperthermia, which increases the risk for death,” Crandall said. “The traditional view is that cocaine increases activity levels resulting in increased heat production; however, we found that in addition to causing increased heat production, impaired heat dissipation is another major mechanism by which cocaine elevates body temperature in humans.

“Identifying the precise molecular mechanisms of cocaine-induced hyperthermia could lead to the identification of new drug targets that may reduce cocaine-related deaths.”

Other researchers included Dr. Ron Victor, chief of hypertension, and Dr. Wanpen Vongpatanasin, assistant professor of internal medicine.

The study was funded by the National Institutes of Health, the American Heart Association and the National Institute on Drug Abuse.

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