New kind of memory trick may help drug addicts recover

April 13 2012, by Bob Yirka

(Medical Xpress) -- Traditionally, treatment for drug addicts has centered around so-called extinction procedures designed to disassociate memories tied with taking drugs to help reduce the cravings that so often result in relapse. Unfortunately, while such procedures help addicts while still in treatment, they don't do much for them afterwards in the real world. Because of this, treatment specialists often turn to drug related therapies to help reduce associative memories. The problem with that approach though is that it's counterintuitive. Treating drug abuse by administering drugs just goes against common sense. Plus there are sometimes unpleasant side effects.

Now however, researchers in China have found that adding a prior element to traditional extinction procedures, seems to, as they describe in their paper published in the journal *Science*, reshuffle the memories associated with triggers that cause cravings, and thus alleviate reactions and the cravings that result, for up to six months.

These new results were based on results achieved by prior research that showed that triggers associated with a painful experience learned over multiple exposures could be reduced or even eliminated by exposing subjects to reminders of the triggers without the painful consequence a few minutes before being exposed to the actual trigger. Over time, subjects ceased feeling fear upon witnessing the actual trigger.

In similar fashion, the researchers found first that rats that had been made to become heroin or cocaine addicts soon learned to stop showing

signs of triggering when shown variations on those triggers a few minutes before being shown the actual triggers, when such triggers did not result in heroin or cocaine being offered. Because of those results, they tried the same sort of exercise with actual heroin patients in a hospital for treatment. They first showed them a video of activities such as people injecting themselves and engaging in other activities that often served as triggers for addicts. They then waited ten minutes before administering the traditional extinction procedures. And that was all it took. The team found that those that had been shown the video prior to the extinction procedures exhibited less reaction to triggers at periods of 1, 30 and 180 days later. They also found that the time lag between the video and when the extinction procedures were given made a big difference. Specifically they found that time differences between one hour and ten minutes were effective, while times greater or less were not.

The researchers theorize that the reason this new approach seems to be working is because the initial video brings older memories to the fore (called reactivating); but when it occurs the person is in a vulnerable memory state. Then, because they are still in that state when the extinction procedures are carried, out, they are more susceptible to holding on to them over longer periods of time.

More research will have to be carried out of course to see if the lowered reactions to triggers over time actually results in lower rates of relapse.

More information: A Memory Retrieval-Extinction Procedure to Prevent Drug Craving and Relapse, *Science* 13 April 2012: Vol. 336 no. 6078 pp. 241-245. DOI: 10.1126/science.1215070

ABSTRACT
Drug use and relapse involve learned associations between drug-associated environmental cues and drug effects. Extinction procedures in

the clinic can suppress conditioned responses to drug cues, but the extinguished responses typically reemerge after exposure to the drug itself (reinstatement), the drug-associated environment (renewal), or the passage of time (spontaneous recovery). We describe a memory retrieval-extinction procedure that decreases conditioned drug effects and drug seeking in rat models of relapse, and drug craving in abstinent heroin addicts. In rats, daily retrieval of drug-associated memories 10 minutes or 1 hour but not 6 hours before extinction sessions attenuated drug-induced reinstatement, spontaneous recovery, and renewal of conditioned drug effects and drug seeking. In heroin addicts, retrieval of drug-associated memories 10 minutes before extinction sessions attenuated cue-induced heroin craving 1, 30, and 180 days later. The memory retrieval-extinction procedure is a promising nonpharmacological method for decreasing drug craving and relapse during abstinence.

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