Scopolamine: An old drug with new psychiatric applications

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Scopolamine is an anticholinergic drug with many uses. For example, it prevents nausea, vomiting, and motion sickness.

However, scopolamine is re-emerging as an antidepressant, with recent studies showing that scopolamine can rapidly improve mood in depressed patients. In addition, in a new study published in *Biological Psychiatry* this month by Dr. Moriel Zelikowsky and colleagues at the University of California, Los Angeles, it may also be a possible treatment for anxiety disorders.

Exposure therapy, where the key goal is the elimination of fear through repeated 'safe' exposure to the threat, is commonly employed for the treatment of anxiety disorders. However, its effectiveness is diminished because humans and animals alike tend to be very sensitive to context, causing extinction learning to be dependent on the environment in which it occurs. This makes memories formed during extinction unstable. As a result, extinguished fears commonly return when people put themselves in new situations.

"Current research aimed at treating this problem either employs invasive, untranslatable methods or attempts to strengthen extinction learning rather than prevent relapse," explained senior author Dr. Michael Fanselow.

In an effort to solve this dilemma, Fanselow and his team took a novel theoretical approach. Employing an animal model of exposure therapy,

they found they were able to disrupt the rats' contextual processing during extinction using low doses of scopolamine, which blocked the return of fear when the rats were exposed to both the original and a new context.

"This finding provides groundbreaking evidence that changing the nature of extinction learning, rather than its magnitude, can produce profound improvements in the prevention of relapse," added Fanselow.

Scopolamine also slowed the rate of extinction memory formation, which was overcome by adding training sessions. Taken together, these findings indicate that scopolamine may serve as a promising pharmacological adjunct to exposure therapy by improving one's resiliency to environmental changes.

"The emerging new uses for scopolamine are quite promising, although further research is needed," commented Dr. John Krystal, Editor of Biological Psychiatry. "These new data are a wonderful example of the capacity of translational neuroscience approaches to identify new uses for old medications."

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