Researchers say just a photo of one's beloved activates the brain's reward centers something like a drug might. Learning how to harness this could help relieve pain without drug-induced side effects, scientists suggest.

By Amina Khan, Los Angeles Times

5:27 PM PDT, October 13, 2010

Sooner or later, love usually ends up hurting. But in its early, blissful throes, it actually lessens pain — at least of the physical kind. That's the finding, reported Wednesday, of a study by pain scientists and a psychologist who studies love.

The study, published online in the journal PLoS ONE, sprang from a meeting of minds between Arthur Aron of State University of New York at Stony Brook, a longtime researcher of the science of love, and Dr. Sean Mackey, a pain scientist at Stanford University. The two shared a hotel room while attending a neuroscience conference a few years back. Their epiphany came one evening over drinks.

"I'd had a couple glasses of Zinfandel and was chatting about pain and the brain systems involved … and he was chatting about love and the brain systems involved," Mackey said. "And we realized, you know, they could be influencing each other."

They knew that a few earlier studies had suggested that love relieved pain, but they wanted to go further and find out just what was happening in the brain. They put out a call on the Stanford campus for people who were in the first nine months of a relationship and still in the throes of romantic passion.

"It was clearly the easiest study we've ever recruited for — within hours we had these students banging on our doors saying, 'We're in love! We're in love! Study us,' " Mackey said.

Jarred Younger, then a Stanford graduate student, and the team tested 15 subjects. All were asked to bring in six photos: three of their beloved and three of a comparably attractive person they knew. The researchers heated the palms of the subjects' left hands to a point that caused either a moderate or high degree of pain, at which point the subjects looked at a photo, either of their beloved or the acquaintance.

In a third round of experiments, the researchers tested the effects of mere distraction, which is known to reduce pain, by having the subjects perform mental tasks (such as thinking of all sports that didn't involve a ball) while their palms were heated.
The photo of the beloved and mental distraction appeared to reduce pain by about the same amount: 36% to 45% for moderate pain, and 12% to 13% for high pain. (The photo of the peer had no effect.) But when the scientists redid the experiment while scanning subjects' brains with a functional MRI, they saw that the photo and the mental-distraction task activated very different parts of the brain.

The distraction task engaged the higher, thinking parts of the brain. A photo of the beloved, on the other hand, engaged the more primitive, "reptilian" regions — reward centers related to urges and cravings that are also implicated in addictions.

Learning how to harness the power of a loved one could help relieve pain without drug-induced side effects — or perhaps help people quit smoking, the scientists suggested.

"Will I be going back to my patients and prescribing one passionate love affair every six months? I don't know if I'm going there," Mackey said. "But it tells us there's a lot more to the experience of pain than just the injury."

Bruce Naliboff, co-director of the UCLA Center for Neurovisceral Sciences & Women's Health, said that the next step could be to separate out how much, if any, of the pain reduction was related to sexual desire.

"It'd be interesting to do an experiment with not just an acquaintance, but someone you feel close to — just not a sexual attraction," said Naliboff, who was not involved in the study.

That might include budding platonic relationships. Recalling that first meeting of minds over drinks during the conference, Aron said, "Talk about novel, challenging, exhilarating... That night, when we had our conversation, if you heated my arm I wouldn't have felt anything."

amina.khan@latimes.com

Copyright © 2010, Los Angeles Times