Abstract

Substance abuse has been a serious health issue. Millions of people in the world are suffering the adverse consequence of substance abuse. Numerous studies have tried to solve drug addiction problems by pharmacological methods. However, most of the drugs in clinical use either are less effective or cause aversive side effect. Recently, several studies suggest that a specific behavioral procedure, a reactivation followed by an extinction, effectively attenuates drug-associated memory. Nevertheless, the underlying mechanism of this behavioral procedure is challenged under some circumstances. We therefore underwent the aforementioned behavioral procedures with some modifications on cocaine-induced conditioned place preference (CPP) paradigm in mice and examined whether the behavioral procedures are as efficient as previously described. The modifications included the reverse sequence of reactivation and extinction, the elevation of cocaine dosage, the insertion of a re-training session, and the comparison with naïve mice. Our findings indicate that there is no significant difference among the extinction only, the retrieval-extinction, and the extinction-retrieval procedures. However, we found that the effects of the behavioral procedures depend on the dosage of cocaine used in the CPP paradigm. The behavioral procedures effectively suppress the cocaine-associated memory induced by the high-dose cocaine and the mice received all three different behavioral procedures express the same resistance to cocaine in the re-training and the priming sessions. On the other hand, the behavioral procedures only attenuate the low-dose cocaine-induced CPP tested 24 h after the procedures, but not the memory tested 24 h after the re-training and immediately after the priming sessions. Therefore, it awaits further studies to elucidate the effects of the reactivation-retrieval behavioral procedures before it can really help human drug addicts.