INTRAVENOUS SELF-ADMINISTRATION OF MORPHINE AND COCAINE: A COMPARATIVE STUDY

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The aim of the present study was to estimate differences between patterns of morphine and cocaine use in Sprague-Dawley rats. This was done by first developing a set of conditions under which both drugs would be consistently self-administered over time. Subsequently rats were studied in groups of three, with only one rat actively self-administering morphine or cocaine while others two receiving yoked injections of either the drug or saline. With the exception of the 0.056, 0.1, 0.3 and 1.0 mg/kg/inj. training-dose regimens, intravenous (iv) self-administration of morphine was acquired at the dose of 0.56 mg/kg/inj. and subsequently maintained by rats. In contrast to morphine self-administration, rats rapidly acquired cocaine self-administration behavior at either the 0.3 or 0.56 injection dose and showed typical inverted U-shaped dose-response curves with maximal responding occurring at the injection dose of 0.3 mg/kg. With the “yoked” pairs of subjects, the rate of responding of the animal actually self-administering the drug was significantly higher than that of a paired animal which passively received injection whenever the first animal self-administered the drug. Thus, both morphine and cocaine served as a positive reinforcer of self-administration behavior under the fixed ratio 5 schedule of reinforcement. However, the 0.56 mg/kg injection dose of morphine resulted in an acquisition curve that was markedly, temporally delayed relative to the injection dose of cocaine. Finally, cocaine maintained higher rates of responding for its delivery than morphine. These differences between self-administration patterns of morphine and cocaine may provide significant information about the nature of drug reinforcement and dependence.

Key words: morphine, cocaine, self-administration, reinforcement