Analgesic efficacy of orally administered buprenorphine in rats: methodologic considerations

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Abstract

Buprenorphine has been widely recommended for treatment of pain in rodents. We have previously documented that the recommended postoperative oral dose of buprenorphine in male Long-Evans rats, 0.5 mg/kg, is not as effective as the recommended parenteral dose of buprenorphine (0.05 mg/kg, s.c.) as an analgesic (21). In the series of experiments reported here, we compared: the analgesic effect of buprenorphine when prepared in two ways in the laboratory with that of a commercially available injectable solution of buprenorphine; the analgesic effect of buprenorphine in Long-Evans rats with that in Sprague-Dawley rats; and Long-Evans and Sprague-Dawley rats for development of pica, a commonly reported side effect of buprenorphine. We followed the pica experiment with assessment of the effectiveness of buprenorphine in establishing a conditioned flavor aversion. The results indicated that method of preparation did not result in any significant differences in the efficacy of injected buprenorphine. Strain of rat was not associated with a significant difference in the efficacy of buprenorphine. However, a significant strain difference was found in development of pica. Buprenorphine treatment was effective in inducing a conditioned flavor aversion. We concluded that the recommended oral dose of buprenorphine (0.5 mg/kg) is ineffective as an analgesic, and that this was not the result of method of preparation of the buprenorphine or strain of rat used. Furthermore, we concluded that buprenorphine treatment may induce gastrointestinal distress in both strains tested. The results reaffirm our previous conclusion that oral administration of buprenorphine at 0.5 mg/kg, despite the general recommendation, is not a reasonable treatment for postsurgical pain in rats.

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