Investigation of the Antidepressant Effect of Curcumin, a Compound from Turmeric (*Curcuma longa*), in the Adult Male Sprague-Dawley Rat

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**Introduction:** Depression is the leading cause of disability between the ages of 15 and 44 in the United States. Limitations of antidepressant therapy often cause people to use alternatives to traditional antidepressant therapies in an attempt to ameliorate or obviate their depressive symptoms. Herbal medications such as curcumin, a compound from turmeric (*Curcuma longa*) have long been reported to have antidepressant properties. The purpose of this study was to examine the antidepressant effects of curcumin and its possible modulation of the benzodiazepine site on the γ-aminobutyric acid (GABAA) receptor.

**Methods:** Utilizing a prospective, between subjects group design, 55 male Sprague-Dawley rats were randomly assigned to 1 of 5 groups: vehicle, 0.5% dimethyl sulfoxide; curcumin, 20 mg/kg; midazolam, 1.5 mg/kg; flumazenil, 3 mg/kg + curcumin, 20 mg/kg; or midazolam, 1.5 mg/kg + curcumin, 20 mg/kg. Forty minutes after intraperitoneal injection of 1 of the study medications, the rats were evaluated during a forced swim test (FST), a tool for evaluating behavioral despair in the rat. Data analyses were performed using a 2-tailed multivariate analysis of variance and least significant difference post hoc test.

**Results:** The 5-minute FST was used to observe 2 behaviors: time mobile and fecal pellet output (FPO). Time mobile was determined to be the total mean time the rats were actively moving. The mean time mobile was significantly lower in the curcumin group compared with the midazolam + curcumin group (p = .021). Furthermore, the midazolam group had the lowest mean time mobile when compared with the vehicle group (p = .028), the flumazenil + curcumin group (p = .026), and the midazolam + curcumin group (p = .001). Mean FPO was significantly higher in the vehicle group (5.9) compared with the curcumin group (4.1, p = .021), the midazolam group (3.4, p = .002), and the midazolam + curcumin group (4.0, p = .015).

**Conclusions:** In isolation, curcumin did not demonstrate a significant increase in mean time mobile during the FST. However, FPO output was decreased with curcumin and also in the group that received curcumin + midazolam. Despite no evidence of a main effect on behavioral despair, the combined results suggest that curcumin may reduce the sedative effects of midazolam and display a slight effect (decreased FPO) on behavioral despair. The effects of herbal medications and their interactions with traditional medications are key pharmacological considerations for the anesthetic provider to understand.

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