Effects of Parenteral Epinephrine and GV-26 Stimulation on Inhalant Anesthesia Recovery Time in Two Orders of Reptiles

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Inhalant anesthetics are frequently used in reptiles and are associated with extended recovery periods.1 Reptiles in the orders Crocodylia and Testudines have unique cardiovascular anatomy, as well as adaptations that allow them to submerge for hours. Their ability to shunt blood away from their lungs presumably results in prolonged induction and recovery times.2 Studies have shown that the pulmonary-systemic shunt in crocodiles can be inhibited with the use of beta-adrenergic stimulation.3 Additionally, adrenergic control of the cardiovascular system in the turtle has also been demonstrated.4 In our 2-part crossover study, using American alligators (Alligator mississippiensis) and common snapping turtles (Chelydra serpentina), individuals were anesthetized with inhalant isoflurane (Isoflurane® USP, Piramal Healthcare Limited, Andhra Pradesh, India) for 90 minutes and then given an intramuscular injection of saline (0.9% sodium chloride injection USP, Baxter Healthcare Corporation, Deerfield, IL 60015, USA, 0.1 ml/kg IM) or epinephrine (epinephrine injection USP, 1 mg/ml solution, IMS Limited, SO. El Monte, CA 91733, USA, 0.1 ml/kg IM). C. serpentina also were given a third treatment, electrical stimulation of GV-26. GV-26 is an acupuncture point purported to aid in the treatment of shock and cardiopulmonary arrest.5 While the efficacy of this point in reducing anesthetic recovery times has not been investigated, an anatomic location for the point has been suggested and employed in sea turtles to help manage apnea.6,7 Reptiles given epinephrine, on average, recovered twice as fast as those given saline. Recovery times between GV-26 and epinephrine were similar. While this was not a safety study, no adverse effects were noted in the study animals. Results from this study were statistically and clinically significant. The use of parenteral epinephrine and/or GV-26 stimulation in the immediate post-anesthetic period may substantially improve our current management of these species.

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References


