Hypoglycemia is a serious complication of diabetes mellitus. Glucagon rapidly elevates blood glucose levels and is administered SC and IV in humans with hypoglycemic crises. The amino acid sequence of glucagon is identical in humans and dogs; this study investigated the effects of SC and IV administration of glucagon on glucose concentration and insulin and cortisol secretion in dogs. Five healthy beagles received 1 mg glucagon or placebo (ie, sterile water) IV or SC. Blood samples were collected pre- and postadministration and analyzed for insulin-like reactivity, glucose, ACTH, and cortisol secretion. Glucagon was well tolerated in all dogs; somnolence was the only observed adverse effect. Glucagon administration resulted in increased glucose concentrations over baseline at 10, 20, and 30 minutes post-administration with peaks at 20 minutes and significantly increased insulin-like reactivity. IV administration resulted in higher glucose concentrations than SC administration. SC administration did not result in significant increase in ACTH or cortisol concentrations; however, IV administration resulted in a significant increase in cortisol 10 minutes postadministration. SC glucagon may have potential for at-home canine hypoglycemic emergencies.

**Commentary**

SC glucagon injection increased glucose levels to 97–146 mg/dL within 20 minutes of administration, which the authors argued would succeed based on recent human studies. Although not as effective as the IV route, human emergency kits with SC glucagon could be used by dog owners to help their pets overcome severe hypoglycemia. In addition, the SC glucagon caused significant increases in insulin secretion that may provide a new stimulation test for future studies of diabetic dogs. Cortisol elevation was limited. Ultimately, this pilot study suggested the need for additional research on emergency glucagon intervention and diabetic testing. It also suggested the potential of an alternative to the glucagon CRI in initial insulinoma or insulin overdose therapy.—Ewan Wolff, DVM

**Source**