

SC Furosemide Administration

Furosemide, a loop diuretic often used to treat congestive heart failure, pulmonary edema, and hypertension, is most commonly given IV, PO, or via constant-rate infusion. The diuretic effect of furosemide is determined by the amount that reaches the renal tubular lumen, not its concentration in plasma. That fact, coupled with furosemide characteristics that make furosemide ideal for SC



injection, led researchers to hypothesize that SC administration may provide similar diuretic effects to the more conventional routes.

Healthy, adult, crossbreed dogs ($n = 7$) were each given furosemide at 2 mg/kg SC, IV, PO, and via constant-rate infusion with a minimum 2-week washout period between each treatment. Blood parameters and urine output were measured at time 0 and 1, 2, 4, 6, and 8 hours after each treatment. Urine output was significantly increased from baseline 1 hour after IV and SC furosemide injection and returned to baseline after 2 and 4 hours, respectively.

Oral administration resulted in peak urine output at 2 hours postpill, and return to baseline was prolonged to 6 hours after administration. Constant-rate infusion administration resulted in a delayed peak at 4 hours, but urine output remained increased for the duration of the study period.

No adverse events were seen following SC injection; SC furosemide administration may be a safe and effective alternative to other routes of administration, especially in compromised patients or when IV access is not available.

Commentary

Furosemide is the mainstay of treatment for animals with congestive heart failure. In many cases, these animals are so unstable that IV access is difficult. The general perception is that IV furosemide is necessary for its rapid onset of action; however, according to this article, SC injection has about the same time of onset as does IV and lasts a little longer.

This is great news for veterinarians who have patients that need to be treated immediately and who want to avoid the struggle of placing an IV catheter. Although IV access may be necessary for other treatments, perhaps the SC route should be preferred for furosemide injections in patients with congestive heart failure.—April Paul, DVM, DACVECC

Source

Harada K, Ukai Y, Kanakubo K, et al. Comparison of the diuretic effect of furosemide by different methods of administration in healthy dogs. *J Vet Emerg Crit Care*. 2015;25(3):364-371.

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