

Assessment of sedation and recovery following subcutaneous injection of midazolam and two doses of flumazenil in bearded dragons (*Pogona vitticeps*)

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Benzodiazepines have been reported to provide adequate sedation in some reptile species (Bressan et al. 2019). This study evaluated sedation following subcutaneous (SC) injection of midazolam cranial to the thoracic limb, followed by two doses of flumazenil in bearded dragons. In a prospective, randomized, experimental crossover study, eight bearded dragons (age: 13–14 months; five males and three females) underwent three treatments with a washout period of 14–16 days.

Midazolam (1 mg kg⁻¹) was injected SC and animals were video-recorded before (T0) and for 180 minutes postinjection (T10–T180). Thirty minutes after midazolam (T30), SC flumazenil [0.05 mg kg⁻¹ (MFL) or 0.1 mg kg⁻¹ (MFH)] or placebo [NaCl 0.9% 0.5 ml kg⁻¹ (MP)] was given. Videos were randomised and scored by a blinded observer using a validated sedation scale (scale range 0–12). Sedation scores were compared: 1) between time points within treatments and 2) between treatments using Friedman and Dunn's post hoc test. Data are presented as [median (min–max)].

Midazolam resulted in measurable sedation in all treatment groups compared to baseline. At T30, before flumazenil/placebo treatment, scores were: MP; 4 (2 – 5), MFL; 4 (2 – 6), MFH; 4 (1 – 6). At T40, after flumazenil/placebo treatment, scores were: MP; 4 (2 – 5), MFL; 1 (0 – 3), MFH; 1 (0 – 3). At T180, scores were: MP; 5 (2 – 6), MFL; 2 (1 – 4), MFH; 3 (0 – 4). Compared to MP, scores were significantly lower with MFL [T40 ($p = 0.026$) and T120–T180 ($p = 0.018$, $p = 0.026$, $p = 0.012$)] and MFH [T40–T150 ($p = 0.026$, $p = 0.026$, $p = 0.008$, $p = 0.037$, $p = 0.012$, $p = 0.026$)].

Subcutaneous midazolam induces moderate sedation in bearded dragons. Both doses of flumazenil caused incomplete sedation reversal.

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Reference

Bressan, TF, Sobreira T, Carregarro AB (2019). Use of Rodent Sedation Tests to Evaluate Midazolam and Flumazenil in Green Iguanas (*Iguana iguana*). J Am Assoc Lab Anim Sci 58, 810-816.