

CONTINUOUS RATE INFUSION OF DEXMEDETOMIDINE VS SUBCUTANEOUS ADMINISTRATION IN ANAESTHETIZED HORSES UNDERGOING MRI EXAMINATION

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Up to 2005, dexmedetomidine use had not been reported in equine. Since then, several experimental and clinical studies have been published. The main reason for this increase relies on its beneficial pharmacological profile, including short half-life and rapid redistribution (1). The aim of the study is to compare the clinical effects and recovery quality after continuous rate infusion (CRI) or subcutaneous administration of dexmedetomidine in horses undergoing general anaesthesia. Fourteen horses scheduled for MRI examination were included. All horses were sedated with acepromazine 0.03 mg kg⁻¹ intravenously (IV) and detomidine 10 µg kg⁻¹ (IV). Anaesthesia was induced with ketamine 3 mg kg⁻¹ (IV) and diazepam 0.04 mg kg⁻¹ (IV) and maintained with isoflurane in 60% oxygen; end-tidal isoflurane concentration was maintained between 1.3-1.4 %. Horses were randomly divided in two groups. Group "Dex CRI" received dexmedetomidine intravenously at 1 µg kg⁻¹ hour⁻¹, group "Dex SC" received 2 µg kg⁻¹ of dexmedetomidine subcutaneously every 60 minutes. If nystagmus or incessant fighting against ventilator occurred, ketamine rescue at 0.1 mg kg⁻¹ was given. In case of sudden movements, thiopental 0.5-1.0 mg kg⁻¹ IV was given. Ringer's lactate was given at 3 mL kg⁻¹ hour⁻¹, dobutamine was administered IV and the rate adjusted to maintain MAP>70 mmHg. Controlled mechanical ventilation using intermittent positive pressure ventilation was adjusted to maintain arterial carbon dioxide partial pressure between 38-45 mmHg. Heart rate, invasive arterial blood pressure, arterial blood gases, total dose of dobutamine administered, ketamine rescue needed, urine production were recorded. Time required until extubation and time to attain sternal and standing position were noted. The main anaesthesiologist assessed recovery quality graded on a standard scoring 5-point scale with a score of 1 representing the best recovery (2). Mann-Whitney U test was applied for non-parametric data and T-test for parametric data (p≤0.05). There was no statistically differences in physiological intra-anaesthetic parameters, in body weight (kg) (CRI 521±53; SC 506±76), age (years) (CRI 10.7±2.1; SC 10.8±4.1), anaesthesia duration (min) (CRI 139±9.7; SC 144±16.2), number of ketamine rescue needed (CRI 1±1.15; SC 0.5±1.13), recovery score (CRI 1.8±1.2; SC 1.5±0.5). Also time until extubation (min) (CRI 11.5±5.0; SC 9.7±2.6), time to attain sternal (min) (CRI 41.5±12.2; SC 49.7±6.0) and standing position (min) (CRI 50.7±14.6; SC 57.2±6.0) were not statistically different. There was statistical significance in urine production (L) (CRI 8.0±3.5; SC 11.1±4.4) and total dobutamine mcg/kg/min (CRI 0.89±0.35; SC 0.56±0.18). Subcutaneous administration of dexmedetomidine has product similar clinical effects to those achieved with CRI. It has permitted a significative reduction in dobutamine administration and a more stable depth of anaesthesia confirmed by the lower number of rescue ketamine boluses required even if not statistically different. Further studies are required to evaluate different dosages both in CRI and subcutaneous administration.

[1] Bettschart-Wolfensberger R., Freeman S.L., Bowen I.M., Aliabadi F.S., Weller R., Huhtinen M., Clarke K.W. Cardiopulmonary effects and pharmacokinetics of i.v. dexmedetomidine in ponies. *Equine Vet J.* 2005 Jan;37(1):60-4. [2] Vettorato E., Chase-topping M.E., Clutton R.E.A comparison of four systems for scoring recovery quality after general anaesthesia in horses. *Equine vet. J.* (2010)42(5) 400-406