Oral sedation of horses

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Sedation is sometimes necessary in horses for clinical assessment and veterinary treatment, and the veterinary surgeon has the advantage of administering sedative combinations intravenously to achieve rapid, predictable effects for short to moderate duration procedures (Gardner et al, 2010; Ramsay et al, 2002).

However, sometimes horses require sedation prior to intravenous medication because of severe needle phobia, which makes attempts at intravenous medication unsafe, or for husbandry procedures such as farriery, indicating a role for orally administered sedation (Gardner et al, 2010; Ramsay et al, 2002).

Only two drugs are licensed in the UK that can be administered orally in horses for sedation – detomidine and acepromazine (ACP).

Detomidine

Administering oral sedation.

Detomidine is an ?2-adrenergic agonist, one of a group of drugs used widely in veterinary practice for effective sedation of all animal species (DiMaio Knych et al, 2011; Gardner et al, 2010; Hubbell et al, 2006; Kaukinen et al, 2011).

As well as providing sedation and muscle relaxation, ?2-agonists provide additional analgesia, making them particularly useful when pain is present (Gardner et al, 2010; Hubbell et al, 2004; Hubbell et al, 2006; Kaukinen et al, 2011). They have also been shown to reduce serum concentrations of stress-related metabolites and hormones, providing an anxiolytic effect (Gardner et al, 2010).

Ramsay et al (2002) demonstrated detomidine (0.06mg/kg to 0.08mg/kg) administered into the buccal cavity provided effective standing sedation of horses. Clinical effects are seen 45 to 75 minutes after administration, and last two to three hours (DiMaio Knych et al, 2011; Ramsay et al, 2002).

Detomidine is a lipophilic weak base, so a wide volume of distribution is achieved following administration and absorption across the oral and pharyngeal mucosa (DiMaio Knych et al, 2011;

Gardner et al, 2010; Ramsay et al, 2002). It is well absorbed from the oral cavity because it is typically an alkaline environment due to high salivary concentrations of bicarbonate, (DiMaio Knych et al, 2011). It undergoes first pass metabolism through the liver (DiMaio Knych et al, 2011; Gardner et al, 2010).

Gardner et al (2010) and DiMaio Knych et al (2011) confirmed 0.04mg/kg detomidine, if administered sublingually, can be used for veterinary or husbandry procedures with significant difference to placebo-treated controls (DiMaio Knych et al, 2011; Gardner et al, 2010; Malone et al, 1993).

It is recommended detomidine be administered sublingually to ensure efficient absorption; however, Ramsay et al (2002) demonstrated efficacy when it was administered indiscriminately into the buccal cavity as will often occur in practice. Sublingual administration of drugs is effective because of the complex vascular and lymphatic network in the sublingual mucosa (DiMaio Knych et al, 2011).

Following sublingual administration, detomidine passes straight into the systemic circulation, rather than undergoing chemical destruction by gastric acid, metabolism in the gastrointestinal tract wall prior to absorption or first pass liver metabolism as occurs following oral ingestion (DiMaio Knych et al, 2011; Kaukinen et al, 2011; Malone et al, 1993). This makes sublingual administration much more effective than oral administration (DiMaio Knych et al, 2011; Gardner et al, 2010; Ramsay et al, 2002). Injectable detomidine mixed with molasses, apple sauce or proprietary preparations can be used sublingually as an alternative to proprietary formulations (Gardner et al, 2010). Proprietary oromucosal gels have a reported bioavailability in one study of 22%, compared to 38% for intramuscular formulations, and a longer terminal half-life. However, the duration of effect is greater for injectable formulations, likely a consequence of the greater bioavailability of these forms (Kaukinen et al, 2011).

Dose-dependent side effects for detomidine administered sublingually are the same as when it is administered parenterally, although less severe, including ataxia, bradycardia, reduced gastrointestinal motility and respiratory depression (Buhl et al, 2007; DiMaio Knych et al, 2011; Gardner et al, 2010; Hubbell et al, 2004; Hubbell et al, 2006; Kaukinen et al, 2011; Malone et al, 1993).

Following sublingual administration of detomidine, a 48-hour withdrawal for detection in plasma and three days for urine samples should be respected (DiMaio Knych et al, 2011).

Acepromazine

ACP is a potent phenothiazine derivative that can also be used to achieve sedation in horses; however, these effects are much milder than with ?2-agonists (Ballard et al, 1982; Hashem et al, 1993).

ACP is an anxiolytic drug, inducing behavioural changes and having minimal effects on coordination and alertness when compared with ?2-agonists (Ballard et al, 1982).

ACP has several indications for equine practice, including as a general anaesthesia premedicant, in sedation combinations and for neuroleptanalgesia when used in combination with analgesics (Hashem et al, 1993). Because of its minimal sedation effects, oral ACP would be unlikely to be given alone for veterinary procedures, rather it would be reserved for husbandry procedures or used in sedative combinations (Ballard et al, 1982).

Hashem et al (1993) compared the pharmacokinetics and pharmacological efficacy of ACP administered intravenously with that administered orally. They found after oral administration ACP was rapidly absorbed with a half-life of 0.84h, and a slower elimination half-life than for intravenous administration.

Following medication, ACP distributes between the central vascular and peripheral compartments, which include the liver, kidneys and so on, with a proportion of the drug bound to plasma proteins (Ballard et al, 1982). This slower elimination half-life of oral preparations could be due to retention and slow release from the peripheral compartment, which may be a consequence of drug being absorbed from the buccal cavity and intestinal tract, along with enterohepatic circulation (Hashem et al, 1993). Equal sedative effects were achieved with an oral dose of 0.5mg/kg and an intravenous dose of 0.1mg/kg.

Side effects of ACP sedation include penile prolapse, bradycardia, respiratory suppression, splenic sequestration of red blood cells manifesting as reduced haematocrit and hypotensive effects; however, these are less pronounced following oral as opposed to intravenous administration (Ballard et al, 1982; Hashem et al, 1993; Miller et al, 1987). Several studies have suggested ACP administered orally provides the same efficiency of sedation, but with fewer side effects than observed following intravenous infusion (Hashem et al, 1993; Miller et al, 1987).

ACP has a large volume of distribution (6.6l/kg) and distributes between a central and peripheral compartment following intravenous injection or gastrointestinal absorption (Ballard et al, 1982; Hashem et al, 1993).

Unlike detomidine, ACP does not have an analgesic effect (Hamm et al, 1991). ACP has behavioural effects that could potentially affect performance, meaning withdrawal periods for competition should be carefully observed (Ballard et al, 1982).

Considerations prior to administration of oral sedation

Before any sedative is administered, several considerations must be made to ensure the safety of the horse and people in the immediate environment, and that the owner is fully aware of the risks and what to expect when a horse is sedated, including possible side effects – for example,

priapism, polyuria, sweating, colic, ataxia (NOAH 1, 2015; NOAH 2, 2015; NOAH 3, 2015).

A disclaimer might be signed to provide documented evidence the owners have had the risks explained to them and accept these.

It is important to ensure the horse has received a full clinical examination in the past six months in accordance with the RCVS Code of Professional Conduct for Veterinary Surgeons for prescription of POM-V medications, providing reassurance the animal in which the drug is going to be used is otherwise healthy (RCVS, 2015). This is especially important when you consider the potential cardiac and respiratory suppressive effects of sedative agents (Buhl et al, 2007; DiMaio Knych et al, 2011; Gardner et al, 2010; Hubbell et al, 2004; Hubbell et al, 2006; Kaukinen et al, 2011; Malone et al, 1993).

The environment in which the horse is going to be sedated should be critically assessed because of the risk of ataxia. Ideally, a horse is sedated in a bedded area or with rubber matting underfoot. Sedation works best when the horse is in a quiet area with minimal distractions. Make sure the horse has no feed in its mouth when the drug is given as this may curtail absorption of the sedative (NOAH 1, 2015; NOAH 2, 2015). Horses should not be tied up while sedated because of the risk for cervical trauma with ataxia.

Domosedan (Vétoquinol) has not been evaluated in horses less than one year of age so its use is not advised in horses younger than this. Domosedan, Relaquine (Dechra) and Sedalin (Vétoquinol) should not be used on horses with renal, hepatic or cardiopulmonary disease, or in pregnant mares, (NOAH 1, 2015; NOAH 2, 2015; NOAH 3, 2015). When used in mares that are lactating the foal may become sedated and the owner should be made aware of this. The effects of the product on fertility have not been evaluated (NOAH 1, 2015).

The duration of sedation achieved is variable, but generally two to three hours for detomidine products and six hours for ACP-containing products. Impermeable gloves should be worn when administering to avoid skin contact with the product (NOAH 1, 2015; NOAH 2, 2015; NOAH 3, 2015).

Conclusion

In conclusion, oral sedation offers an effective means for sedating needle-phobic horses or for owners to sedate horses for management procedures. Adrenaline can antagonise the effects of ?2-agonists, so owners should be warned that despite recommended doses the sedation effect achieved is variable, and a sedated horse can still kick.

Veterinary surgeons should prescribe oral sedation responsibly, and be aware of the potential adverse effects associated with their use. Where possible, injectable sedation should be offered as an alternative for management procedures, with veterinary supervision available to ensure the level

of sedation is appropriate and in case of an adverse reaction.

References

- Ballard S, Shults T and Kownacki A A (1982). The pharmacokinetics, pharmacological responses and behavioural effects of acepromazine in the horse, *Journal of Veterinary Pharmacology and Therapeutics* **5**(1): 21-31.
- Buhl R, Ersbøll A K, Larsen N H, Eriksen L and Koch J (2007). The effects of detomidine, romifidine or acepromazine on echocardiographic measurements and cardiac function in normal horses, *Veterinary Anaesthesia and Analgesia* **34**(1): 1-8.
- DiMaio Knych H K and Stanley S D (2011). Pharmacokinetics and pharmacodynamics of detomidine following sublingual administration to horses, *American Journal of Veterinary Research* **72**(10): 1,378-1,385.
- Gardner R B, White G W, Ramsey D S, Boucher J F, Kilgore W R and Huhtinen M K (2010). Efficacy of sublingual administration of detomidine gel for sedation of horses undergoing veterinary and husbandry procedures under field conditions, *Journal of the American Veterinary Medical Association* **237**(12): 1,459-1,464.
- Hamm D and Jochle W (1991). Sedation and analgesia with Domosedan (detomidine hydrochloride) or acepromazine for suturing of the vulvar lips in mares (Caslick's Surgery), *Equine Veterinary Science* **11**(2): 86-88.
- Hashem A and Keller H (1993). Disposition, bioavailability and clinical efficacy of orally administered acepromazine in the horse, *Journal of Veterinary Pharmacology and Therapeutics* **16**(3): 359-368.
- Hubbell I A and Muir W W (2006). Antagonism of detomidine sedation in the horse using intravenous tolazoline or atipamezole, *Equine Veterinary Journal* **38**(3): 238-241.
- Hubbell J A E and Muir W W (2004). Use of the alpha-2 agonists xylazine and detomidine in the perianaesthetic period in the horse, *Equine Veterinary Education* **16**(6): 326-332.
- Kaukinen H, Aspegren J, Hyyppa S, Tamm L and Salonen J S (2011). Bioavailability of detomidine administered sublingually to horses as an oromucosal gel, *Journal of Veterinary Pharmacology and Therapeutics* **34**(1): 76-81.
- Malone J H and Clarke K W (1993). A comparison of the ef?cacy of detomidine by sublingual and intramuscular administration in ponies, *Journal of Veterinary Anaesthesia* **20**(2): 73-77.
- Miller P J, Martin I C A, Kohnke J R and Rose R J (1987). Response of horses to acepromazine maleate administered orally in a paste, *Research in Veterinary Science* **42**(3): 318-325.
- Ramsay E C, Geiser D, Carter W and Tobin T (2002). Serum concentrations and effects of detomidine delivered orally to horses in three different mediums, *Veterinary Anaesthesia and Analgesia* **29**(4): 219-222.
- NOAH 1 (2015). *Domosedan Gel 7.6mg/ml Oromucosal Gel*, www.noahcompendium.co.uk/V_AOk-toquinol_UK_Ltd/Domosedan_Gel_7_6mg_ml_Oromucosal_Gel/-52164.html Accessed

1/8/15.
- NOAH 2 (2015). *Relaquine 35 mg/ml Oral Gel for Horses*, www.noahcompendium.co.uk/Dechra_Veterinary_Products_Limited/Relaquine_35_mg_ml_Oral_Gel_for_Horses/-56335.html Accessed 1/8/15.
- NOAH 3 (2015). *Sedalin 35 mg/ml Oral Gel*, www.noahcompendium.co.uk/V_AOk-toquinol_UK_Ltd/Sedalin_35mg_ml_Oral_Gel/-46954.html Accessed 1/8/15.
- RCVS (2015). *Code of Professional Conduct for Veterinary Surgeons*, www.rcvs.org.uk/advice-and-guidance/code-of-professional-conduct-for-veterinary-surgeons/supporting-guidance/veterinary-medicines Accessed 1/8/15.