

Analgesia with maropitant in bitches anesthetized with tiletamine, zolazepam, atropine and detomidine**Analgesia com maropitant em cadelas anestesiadas com tiletamina, zolazepam, atropina e detomidina**

DOI:10.34117/bjdv6n9-439

Recebimento dos originais:08/08/2020

Aceitação para publicação:16/09/2020

Rafael Santos Tramontin

Doutorando em Ciência Animal da Universidade Paranaense (UNIPAR)

Professor da Universidade Cesumar

Endereço: Avenida Guedner, 1610, Jardim Aclimação, 87050-900, Maringá, PR,

E-mail:rafael_tramontin@hotmail.com

Pollyana Linhares Sala

Doutor, UNIPAR

Endereço: Praça Mascarenhas de Moraes, 4282, Centro, 87502-210, Umuarama, PR

E-mail: pollyanasala@gmail.com

Talita Bianchin Borges

Doutoranda em Ciência animal, UNIPAR

Endereço: Praça Mascarenhas de Moraes, 4282, Centro, 87502-210, Umuarama, PR

E-mail:t-borges@hotmail.com

Wellington Henrique Bessi

Mestrando em Biociência Animal

Faculdade de Zootecnia e Engenharia de Alimentos da Universidade de São Paulo

Endereço:Av. Duque de Caxias Norte, 225, Campus Fernando Costa, USP, 13635-900, Pirassununga, SP

E-mail:wellingtonbessi@hotmail.com

Salviano Tramontin Belettini

Doutor, Professor da UNIPAR

Endereço: Praça Mascarenhas de Moraes, 4282, Centro, 87502-210, Umuarama, PR

E-mail: salviano@prof.unipar.br

Natália Saraiva Rodrigues

Mestranda em Ciência Animal, UNIPAR

Endereço: Praça Mascarenhas de Moraes, 4282, Centro, 87502-210, Umuarama, PR

E-mail: nataliasrodrigues123@hotmail.com

Ana Maria Quessada

Doutor, Professora da UNIPAR

Endereço: Praça Mascarenhas de Moraes, 4282, Centro, 87502-210, Umuarama, PR

E-mail: mariaquessada@prof.unipar.br

José Ricardo Pachaly

Doutor, Instituto Brasileiro de Especialidades em Medicina Veterinária (ESPECIALVET)

Endereço: Rua Lopes Trovão, 250, Zona 04, 87014-080, Maringá, PR

E-mail:pachaly@uol.com.br

ABSTRACT

In order to test the analgesic effect of the citrate of maropitant (antiemetic drug) in association with ZAD-50 (tiletamine associated to zolazepam, atropine, and detomidine), 20 female dogs were divided into two equal groups and submitted to elective ovariohysterectomy. Anesthesia was induced in the first group (control group) by administering only ZAD-50, while ZAD-50 in association with maropitant was administered in the second group (experimental group). Analgesia was evaluated by means of visceral relaxation to the traction of the ovarian pedicles. The maropitant group showed no pain sensitivity during the evaluation. Thus, it was concluded that the use of maropitant citrate prior to ZAD-50 administration provided greater relaxation and visceral analgesia than the isolated use of this anesthetic in the elective ovariohysterectomy of bitches.

Keywords: analgesic, anesthesiology, canine, dissociative anesthetics.

RESUMO

Com o objetivo de testar o efeito analgésico do citrato de maropitant (anti-emético), em associação ao ZAD-50 (tiletamina associada a zolazepam, atropina e detomidina), foram anestesiadas 20 cadelas submetidas a ovariohisterectomia eletiva, divididas em dois grupos iguais. No primeiro grupo (controle) a anestesia foi realizada somente pelo emprego de ZAD-50 e no segundo grupo experimental associou-se maropitant ao ZAD-50. A analgesia foi avaliada por meio do relaxamento visceral à tração dos pedículos ovarianos. Nos animais do grupo em que se empregou maropitant houve ausência de sensibilidade dolorosa em todos os momentos de avaliação. Conclui-se que o emprego do citrato de maropitant previamente ao ZAD-50 proporcionou maior relaxamento e analgesia visceral que a utilização isolada dessa associação anestésica para ovariohisterectomia eletiva em cadelas.

Palavras-chave: analgésico, anestesiologia, anestésicos dissociativos, canino.

1 INTRODUCTION

The association of zolazepam, tiletamine, atropine, and detomidine as a formulation called ZAD-50, in doses calculated by allometric extrapolation, has been used successfully in canine anesthesia (CIANCA et al., 2014).

Maropitant is a neurokinin-1 (NK-1) neuroreceptor antagonist. Due to this pharmacological action, maropitant is effective in preventing vomiting (BRUNSON, 2015). In addition to the inhibition of vomiting, research has shown that the drug can reduce pain by producing visceral analgesia in dogs and cats (BOSCAN et al., 2011).

The objective of this study was to evaluate the analgesic effect of maropitant citrate when used in combination with tiletamine, zolazepam, atropine, and detomidine in the anesthetic procedure for elective ovariohysterectomy (OH) in dogs.

2 MATERIAL AND METHODS

This study included 20 female dogs, divided into two equal groups. The control group and experimental group were denominated as ZAD group and ZAD/maropitant group, respectively.

The basic anesthetic protocol applied in both groups was the combination of drugs consisting of zolazepam and tiletamine hydrochloride (Zoletil®) along with atropine sulfate and detomidine hydrochloride (Dormiun-V®), initially studied and named ZAD-50 (PACHALY; VOLTARELLI-PACHALY, 2011, CIANCA et al., 2014).

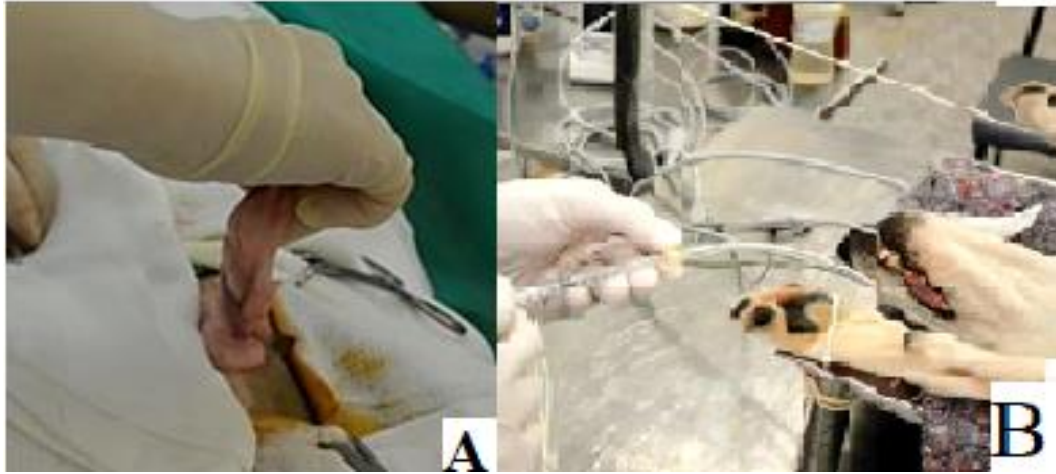
For the zolazepam and tiletamine combination, the doses indicated for domestic dogs of 0.05 mg/kg and 5.0 mg/kg, respectively, were used. A dose of 10 to 20 mcg/kg of detomidine indicated for the domestic horse was used (PAPICH, 1995).

In the ZAD/maropitant group, 1.0 mg/kg maropitant citrate (Cerenia®, as per the dose indicated for domestic dogs) was administered subcutaneously two hours prior to ZAD-50 injection (ZOETIS, 2013).

The calculated dose of the ZAD-50 anesthetic combination was divided into two equal parts and packed in two 1.0 ml syringes. The first part (half of the calculated dose) was used to induce anesthesia intramuscularly. The other half was packed in a 1.0 mL disposable syringe, and 0.9% sodium chloride solution was added to make a total volume of 1.0 mL. This solution was reserved for intravenous administration in 0.1 mL fractions, based on the analgesic needs defined by the analgesic monitoring of the surgeon in the intraoperative period.

Based on the information provided by the surgeon about visceral relaxation (Figure 1A), a 0.1 mL dose of diluted ZAD-50 would be sequentially administered if necessary (Figure 1B). If this dose was not sufficient to produce visceral relaxation, the procedure of injecting 0.1 mL of the solution would be repeated until the surgeon reported that relaxation was adequate (Figure 1B).

Figure 1 - Photographic image of a female dog during an elective ovariohysterectomy procedure, anesthetized by the pharmacological association ZAD-50 (Zoletil / 100® + Atropine + Dormiun-V®) in combination with maropitant citrate. A: Moment of traction of a uterine horn in order to evaluation of ovarian pedicle relaxation. B: Intravenous administration of a diluted ZAD-50 fraction.



Source: the authors

The evaluation of the visceral relaxation was performed mainly by observing the reaction to the traction of the ovarian pedicles every 10 minutes (Figure 1A). This evaluation was classified as follows: A, excellent relaxation (easy to expose the ovarian pedicle); B, regular relaxation (medium difficulty in exposing the ovarian pedicle); and C, insufficient relaxation (high difficulty in exposing the pedicle) (PACHALY et al., 2014).

Statistical analysis was performed using the Bioestat® 5.0 program, and all the sample data were submitted for descriptive statistics. Spearman's correlation test, variance analysis, and Tukey's test were performed to compare the results within each group. The student t-test was used to compare the results between the groups.

3 RESULTS AND DISCUSSION

No deaths were reported in this experiment. The absence of deaths was probably related to the fact that the dogs were classified as ASA I, since the death rate is low in this class of patients (RODRIGUES et al., 2017).

Subcutaneous administration of maropitant caused discomfort in all patients. Pain in the administration of this drug has been reported in the literature (NARISHETTY et al., 2009), but was not considered important because it was for a short duration in the studied animals.

Decubitus occurred for approximately three minutes in both groups, with no statistically significant difference between them. These results are like another study using the ZAD protocol in dogs (CIANCA et al, 2014), and reflected the animals' response to the drugs.

One of the parameters used to analyze intraoperative analgesia in the OH of dogs was visceral relaxation (TAMANHO et al., 2010), and it presented a statistical difference between the groups. In the ZAD/maropitant group, all the animals presented classification A related to the absence of pain sensitivity during all periods of evaluation. In the ZAD group, the observed classifications were B and mainly C. These results showed that better analgesia in pedicular traction was observed in dogs pre-medicated with maropitant citrate, thus demonstrating the analgesic effect of the drug in dogs (BOSCAN et al., 2011). This effect can be explained by the action of the maropitant on the visceral smooth musculature. A study in rats showed that the drug decreased the luminal rhythmic flow in the intestinal ileum resulting in decreased total motility (MIKAWA et al., 2015).

All patients recovered satisfactorily, and subsequently referred for adoption.

4 CONCLUSION

The administration of maropitant citrate prior to ZAD-50 provided greater relaxation and visceral analgesia than the isolated use of this anesthetic in elective OH in dogs. Thus, the inclusion of this drug in the anesthetic protocol is suggested to achieve analgesia and visceral relaxation during OH procedure in female dogs.

ACKNOWLEDMENT

To Universidade Paranaense (UNIPAR) by financial support

REFERENCES

- BOSCAN, P. et al. Effect of maropitant, a neurokinin 1 receptor antagonist, on anesthetic requirements during noxious visceral stimulation of the ovary in dogs. *American Journal of Veterinary Research*, v. 72, n. 12, p. 1576-1579, 2011.
- BRUNSON, D.B. Cerenia use in the perioperative care of animals. In: MICHIGAN VETERINARY CONFERENCE, 2015, Lansing, MI. Proceedings... Okemos: Michigan Veterinary Medical Association, 2015.
- CIANCA, R.C. et al. Novo método para contenção farmacológica e anestesia de campo em cães domésticos (*Canis familiaris*), empregando a fórmula “ZAD-50” (Zoletil/50® + Atropina + Dormiun-V®). *MEDVEP*, v. 12, n. 40, p. 158-158, 2014.
- MIKAWA, S. et al. Anti-emetic drug maropitant induces intestinal motility disorder but not anti-inflammatory action in mice. *Journal of Veterinary Medical Science*, v. 77, n. 10, p. 1195-1199, 2015. Available from: https://www.jstage.jst.go.jp/article/jvms/advpub/0/advpub_15-0182/_pdf/-char/ja.
- NARISHETTY, S.T. et al. Effect of refrigeration of the antiemetic Cerenia (maropitant) on pain on injection. *Veterinary Therapeutics*, v. 10, n. 3, p. 93, 2009. Available from: https://www.researchgate.net/profile/Sunil_Narishetty/publication/40804934_Effect_of_Refrigeration_of_the_Antiemetic_Cerenia_Maropitant_on_Pain_on_Injection/links/5481cee60cf21e8a539f6d9e.pdf.
- PACHALY, J.R. et al. Cetamina, xilazina e atropina, em doses calculadas por extrapolação alométrica interespecífica, para contenção farmacológica da cutia (*Dasyprocta azarae*). *Arquivos de Ciências Veterinárias e Zoologia da UNIPAR*, v. 17, p. 11-26, 2014. Available from: <https://revistas.unipar.br/index.php/veterinaria/article/view/4912/2853>
- PACHALY, J.R.; VOLTARELLI-PACHALY, E.M. Novo método para contenção farmacológica e anestesia de campo em leões (*Panthera leo*), empregando a fórmula ZAD (Zoletil/100 + Atropina + Dormiun-V) Relato preliminar. *A Hora Veterinária*, v. 31, p. 75-80, 2011.
- PAPICH, M.G. Table of common drugs: Approximate dosages. In: John D. Bonagura (Ed.) *Kirk's current veterinary therapy*. 12. ed. Philadelphia: W.B. Saunders, 1995. p. 1429-1446.
- RODRIGUES, N.M. et al. Estado físico e risco anestésico em cães e gatos: Revisão. *PUBVET*, v.11, n.8, p.781-788, ago. 2017. Available form: <http://www.pubvet.com.br/artigo/3990/estado-fiacutesico-e-risco-anesteacutesico-em-catildees-e-gatos-revisatildeo>
- TAMANHO, R.B. et al. Anestesia epidural cranial com lidocaína e morfina para campanhas de castração em cães. *Ciência Rural*, p. 115-122, 2010. Available from: <https://www.scielo.br/pdf/cr/v40n1/a424cr1916.pdf>.
- ZOETIS Indústria de Produtos Veterinários Ltda. Cerenia®: bula. Chapecó, 2013. Available from: https://www.zoetis.com.br/global-assets/private/cerenia_0.pdf.