

Use of Homeopathic *Arnica montana* 30cH for Postoperative Analgesia in Female Dogs Undergoing Elective Ovariohysterectomy

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Abstract

Background Ovariohysterectomy (OH) is one of the most frequent elective surgical procedures in routine veterinary practice. *Arnica montana* is a well-known medicine in phytotherapy, with proven analgesic, anti-inflammatory, antiseptic, healing, antioxidant and immunomodulatory activity. However, there is still a shortage of studies on the action and effects of the homeopathic formulation of the medicine on animals. The aim of this study was to evaluate analgesia with *Arnica montana* 30cH during the postoperative period after elective OH.

Methods Thirty healthy female dogs, aged 1 to 3 years, weighing 7 to 14 kg, were selected at the Veterinary Hospital in Campo Mourão, Paraná, Brazil. The dogs underwent the surgical procedure with an anaesthetic protocol and analgesia that had the aim of maintaining the patient's wellbeing. After the procedure, they were randomly divided into three groups of 10. One group received *Arnica montana* 30cH; another received 5% hydroalcoholic solution; and the third group, 0.9% NaCl saline solution. All animals received four drops of the respective solution sublingually and under blinded conditions, every 10 minutes for 1 hour, after the inhalational anaesthetic had been withdrawn. The Glasgow Composite Measure Pain Scale was used to analyse the effect of therapy. Analysis of variance (ANOVA) followed by the Tukey test was used to evaluate the test data. Statistical differences were deemed significant when $p \leq 0.05$.

Results The *Arnica montana* 30cH group maintained analgesia on average for 17.8 ± 3.6 hours, whilst the hydroalcoholic solution group did so for 5.1 ± 1.2 hours and the saline solution group for 4.1 ± 0.9 hours ($p \leq 0.05$).

Conclusion These data demonstrate that *Arnica montana* 30cH presented a more significant analgesic effect than the control groups, thus indicating its potential for postoperative analgesia in dogs undergoing OH.

Keywords

- homeopathy
- analgesia
- ovariohysterectomy
- dog

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Introduction

Ovariohysterectomy (OH) is a commonly performed surgical procedure in routine veterinary practice. Its main benefits are to reduce the incidence of mammary neoplasia and pyometra, and to promote population control.¹ Non-steroidal anti-inflammatory drugs (NSAIDs) and analgesics are commonly administered for pain control after this procedure.²

Arnica montana is one of the most popular medicines in herbal medicine and homeopathy. It is used in several homeopathic formulations, for use topically, in the form of creams, ointments or gels; or orally, in the form of hydroalcoholic solution and as solid granules or pills. However, this variety of forms can impair evaluation of the effectiveness of this medicine.³ This plant has been used for centuries to reduce inflammation and pain from sprains, bruises and wounds.

Arnica montana is a plant of the Asteraceae family, also known as mountain tobacco or leopard's bane. It is a source of flavonoids, carotenoids, phenolic acids and sesquiterpene lactones.^{4,5} It has analgesic, anti-inflammatory, antiseptic and healing actions, and its use is recommended especially for trauma, dislocations, sprains and tendonitis.⁶ In addition, it has antioxidant and immunomodulatory activity.⁷ It provides reduction of oedema and anti-inflammatory effects in facial plastic surgery and dental surgery.^{8,9}

Studies on the effects of this medication on animals are still scarce, though experiments on rats have highlighted reduction of oedema and better healing.^{10,11}

The aim of the present veterinary study was to evaluate analgesia with *Arnica montana* 30cH after the surgical procedure of OH.

Methods

Subjects

Thirty mixed-breed female dogs, aged 1 to 3 years and weighing 7 to 14 kg, which were admitted for elective OH at the Veterinary Hospital in Campo Mourão, Paraná, Brazil, were selected. All of them were classified as ASA 1, according to the anaesthetic risk classification proposed by the American Society of Anesthesiologists.

Ethics

The study was approved (protocol 2124/2017) by the Animal Experimentation Ethics Committee (CEEA) of the Integrated Faculty of Campo Mourão, in accordance with the rules and standards of the Brazilian National Council for the Control of Animal Experimentation (CONCEA) 2124/2017 (**Supplementary Files 1A and 1B**, available online only), including veterinary research. All pet owners signed a consent statement (**Supplementary Files 2A and 2B**, available online only) before participating in this double-blinded study.

The preparations for the medication and control groups were produced at a commercial pharmacy accredited by ANVISA (the Brazilian health care regulatory agency), and the method used to prepare this medication followed the Brazilian Homeopathic Pharmacopeia.

Randomisation for the Experiment

The patients were randomly divided into three groups. Randomisation was performed by means of a draw out of a bag: one of three pieces of paper stating each of the treatments was opened (*Arnica montana* 30cH, produced in accordance with the Brazilian Pharmacopeia; 5% hydroalcoholic solution; or 0.9% NaCl solution). All the groups received four drops of the respective solution sublingually, every 10 minutes for 1 hour, after the inhalational anaesthetic had been withdrawn.

Anaesthesia Protocol

The patients were subjected to fasting for 8 hours with regard to feed and for 2 hours with regard to water. They then received acepromazine (0.05 mg/kg) and morphine (0.5 mg/kg), intramuscularly as pre-anaesthesia medication.

Thirty minutes after administration of the pre-anaesthesia medication, the surgical site for venous catheterisation was shaved, and the catheter was inserted. Anaesthesia was induced using propofol and the dose was allowed to take effect so that orotracheal intubation would become possible. Following this, the patient was subjected to inhalational anaesthesia, and this was maintained using isoflurane in a semi-closed system, at a concentration of 1.5V%, diluted in an oxygen flow of 20 mL/kg/min.

Epidural anaesthesia was induced using lidocaine without vasoconstrictor (4.5 mg/kg), after antisepsis of the lumbosacral region. After 5 minutes, the patient was placed in the supine position and sustained with a thermal mattress pad, with monitoring of pulse oximetry, systolic blood pressure, electrocardiography, and rectal temperature.

During anaesthesia, the patient received fluid therapy consisting of Ringer's lactate (10 mL/kg/h). At the end of the surgical procedure, each patient began to receive treatment according to the group to which it had been allocated.

Evaluation of Analgesia

After the patient had recovered from the anaesthesia, the evaluation of postoperative analgesia began. This consisted of measuring behavioral parameters every hour, for a total of 24 hours. For this purpose, the short-form Glasgow Composite Measure Pain Scale (CMPS-SF)¹² for acute pain was used, which gave scores for each of the parameters. The CMPS-SF is a validated instrument for use in measuring acute pain in dogs.¹² It includes 30 descriptor options within six behavioral categories. Within each category, the descriptors are ranked numerically according to their associated pain (**Supplementary File 3**, available online only). The maximum pain score is represented by a score of 24 points. For this study, a single observer, who was unaware of the treatment used, evaluated the degree of anaesthesia. If the patient reached a total score greater than or equal to 6, the experiment was stopped, and intravenous dipyrone (25 mg/kg) and meloxicam (0.2 mg/kg) were administered.

Statistical Analysis

The data were evaluated using the GraphPad Prism 5.0 system, by means of analysis of variance (ANOVA) followed by the Tukey test. Statistical differences were deemed significant when $p \leq 0.05$.

Table 1 Means and standard deviations of weights (kg), ages (months), duration of surgery (minutes) and propofol dose (mg/kg) used in inducing anaesthesia in female dogs undergoing elective ovariohysterectomy, grouped according to the treatment received in the immediate post-anaesthesia period

Groups	Weight (kg)	Age (months)	Duration of surgery (minutes)	Propofol dose (mg/kg)
0.9% NaCl solution	8.4 ± 1.19	18.7 ± 3.52	35.0 ± 3.23	3.04 ± 0.09
Hydroalcoholic solution	8.8 ± 1.53	19.1 ± 4.45	36.4 ± 4.11	3.04 ± 0.06
<i>Arnica montana</i>	8.0 ± 1.16	16.8 ± 4.36	36.6 ± 4.69	3.07 ± 0.10

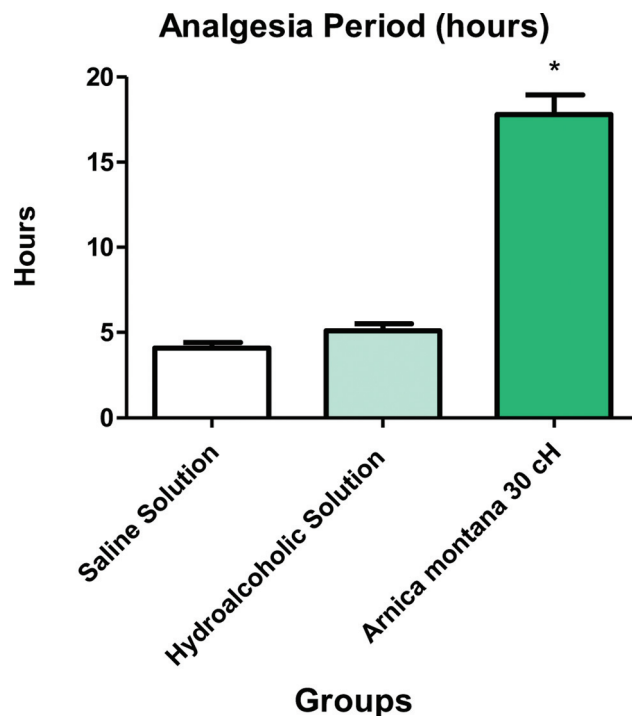


Fig. 1 Duration of analgesia in the hydroalcoholic solution, saline solution and *Arnica montana* 30cH groups. Data are shown as means and standard deviations. * $p \leq 0.002$ in relation to the other groups.

Results

The results regarding weight, age, duration of surgery and propofol dose used for inducing anaesthesia can be seen in **Table 1**. There were no statistically significant differences in the data analysed.

The *Arnica montana* group presented an average duration of analgesia of 17.8 ± 3.6 hours (mean \pm standard deviation). This was significantly longer than its duration in the other groups ($p \leq 0.002$): 5.1 ± 1.2 hours in the hydroalcoholic solution group and 4.1 ± 0.9 hours in the saline solution group (**Fig. 1**).

Discussion

In a systematic review on dogs post-OH, it was demonstrated that opioids were used in 39.0% of the studies, NSAIDs in 19.4%, a combination of NSAIDs and opioids in 19.4% and local analgesics in 6.5%.¹³ In another study, four out of eight

dogs in each of the morphine and tramadol groups needed rescue analgesia as early as 1 hour post-surgery, whilst only one dog in the combination group required rescue analgesia by 6 hours post-surgery.¹⁴

The use of these analgesics was justified because this was a clinical study and the animal subjects' welfare needed to be ensured. In analysing the results obtained, it is clear that the analgesic effect of the *Arnica montana* group was much more long-lasting and was not influenced by the use of the trans-operative analgesics, since their effect ended in not more than 5 hours in the saline and hydroalcoholic solution groups.

In a previous study, no difference in analgesia was observed through administration of *Arnica montana* to women undergoing OH, but the *Arnica montana* dosage regimen may have been less than ideal, thus impairing the assessment.¹⁵ In patients undergoing tonsillectomy, postoperative use of homeopathic medication (at potency C9–Boiron) reduced pain intensity.¹⁶ In the present study, *Arnica montana* provided more extended long-lasting analgesia than was seen in the control groups.

Another study, with 16 dogs, demonstrated that the analgesic and anti-inflammatory effect of *Arnica montana* 12cH was similar to that of NSAIDs.¹⁷ In the present study, the mean analgesic effect through using *Arnica montana* 30cH lasted 17 hours. It is important to point out that in the present study, *Arnica montana* was administered only in the first hour after the surgical procedure, which differed from previous studies.

Promising results from use of *Arnica montana* in cases of bone marrow oedema in the knee region, which were treated individually using classical homeopathy, were reported in two cases in humans.¹⁸

In addition to analgesia, homeopathic therapy can induce better recovery of postoperative mobility; furthermore, less bleeding, extra-oral bruising and oedema was observed in a study on 23 humans who received *Arnica montana*.¹⁹ Faster recovery from anaesthesia after ovarian hysterectomy was observed among dogs that received *Papaver somniferum* 200cH than in the control groups that received saline and hydroalcoholic solutions.²⁰ A review also showed that *Arnica montana* was more effective than placebo, including improvements in post-traumatic pain, oedema and ecchymosis.²¹

In adult Wistar rats with oedema, *Arnica montana* 6cH demonstrated anti-inflammatory and suppressive effects,

through blocking the action of histamine in increasing vascular permeability; rats that exhibited late oedema presented less intense oedema.¹¹ This result corroborated the findings of another study on Wistar rats, using a potency of 6cH on acute and chronic inflammation models. *Arnica montana* showed a significant inhibitory effect compared with the control group, starting from the first hour after application.²² *Arnica montana* 1000 Korsakovian, in the form of drops in 30% hydroalcoholic solution, was found to reduce seroma and blood volume in women undergoing mastectomy surgery, compared with the placebo group, within just 5 days of treatment.²³

Arnica montana is free from side effects, unlike NSAIDs. Though NSAIDs are highly recommended after surgery, they can cause gastritis, gastric ulceration and kidney injuries.^{24–26}

In vitro studies using macrophages demonstrated that treatment of cells using *Arnica montana* modulated the expression of genes relating to chronic inflammation, through encoding vasoactive chemokine and cytokine receptors.²⁷

A further *in vivo* study showed that the action of *Arnica montana* 6cH on vascular dynamics in acute inflammation depended on individual variations.¹¹ This result affirmed the need for individualised treatment for patients and to seek the simillimum, based on the principle of “*similia similibus curentur*” (let like be cured by like), which is one of the pillars of homeopathy.²⁸

Conclusion

Arnica montana 30cH had good analgesic effect, thus indicating its potential as an agent for postoperative analgesia in female dogs undergoing OH.

Highlights

- This study is the first to use *Arnica montana* 30cH for postoperative analgesia in female dogs undergoing ovariohysterectomy (OH).
- The study design was randomised, blinded and placebo-controlled, to evaluate effectiveness.
- Data analysis included comparison of effects of homeopathic treatment and placebos in analgesia post-OH.
- The results suggest that homeopathic treatment was beneficial: *Arnica montana* 30cH presented a more significant analgesic effect than the control groups.

Supplementary material

Supplementary File 1. Ethics Committee approval certificate.

Supplementary File 2. Pet owners' terms of consent.

Supplementary File 3. Short Form of the Glasgow Composite Pain Scale.

Conflict of Interest
None declared.

References

- 1 Kustritz MVR. Population control in small animals. *Vet Clin North Am Small Anim Pract* 2018;48:721–732
- 2 KuKanich B, Bidgood T, Knesl O. Clinical pharmacology of non-steroidal anti-inflammatory drugs in dogs. *Vet Anaesth Analg* 2012;39:69–90
- 3 Bellavite P, Marzotto M, Bonafini C. *Arnica montana* experimental studies: confounders and biases? *J Integr Med* 2018;16:72–76
- 4 Blumenthal M, Goldeberg A, Brinckmann J. *Herbal Medicine: Expanded Commission and Monographs*. Newton: Integrative Medicine Communications; 2000
- 5 Clauser M, Aiello N, Scartezzini F, Innocenti G, Dall'Acqua S. Differences in the chemical composition of *Arnica montana* flowers from wild populations of north Italy. *Nat Prod Commun* 2014;9:3–6
- 6 Foster S, Tyler VE. *Tyler's Honest Herbal: A Sensible Guide to Use of Herbs and Related Remedies*. 4th ed. Binghamton: Haworth Herbal; 1999
- 7 Kriplani P, Guarve K, Baghael US. *Arnica montana* L.—a plant of healing: review. *Rev J Pharm Pharmacol* 2017;69:925–945
- 8 Seeley BM, Denton AB, Ahn MS, Maas CS. Effect of homeopathic *Arnica montana* on bruising in face-lifts: results of a randomized, double-blind, placebo-controlled clinical trial. *Arch Facial Plast Surg* 2006;8:54–59
- 9 Chalet SR, Marcus BC. Perioperative *Arnica montana* for reduction of ecchymosis in rhinoplasty surgery. *Ann Plast Surg* 2016;76:477–482
- 10 Alfredo PP, Anaruma CA, Pião ACS, João SMA, Casarotto RA. Effects of phonophoresis with *Arnica montana* onto acute inflammatory process in rat skeletal muscles: an experimental study. *Ultrasonics* 2009;49:466–471
- 11 Kawakami AP, Sato C, Cardoso TN, Bonamin LV. Inflammatory process modulation by homeopathic *Arnica montana* 6CH: The role of individual variation. *Evid Based Complement Alternat Med* 2011;2011:917541
- 12 Reid J, Nolan AM, Hughes JML, Lascelles D, Pawson P, Scott EM. Development of the short-form Glasgow composite measure pain scale (CMPS-SF) and derivation of an analgesic intervention score. *Anim Welf* 2007;16:97–104
- 13 Mwangi WE, Mogo EM, Mwangi JN, Mbuthia PG, Mbugua SW. A systematic review of analgesia practices in dogs undergoing ovariohysterectomy. *Vet World* 2018;11:1725–1735
- 14 Kongara K, Chambers JP, Johnson CB. Effects of tramadol, morphine or their combination in dogs undergoing ovariohysterectomy on peri-operative electroencephalographic responses and post-operative pain. *N Z Vet J* 2012;60:129–135
- 15 Hart O, Mullee MA, Lewith G, Miller J. Double-blind, placebo-controlled, randomized clinical trial of homeopathic arnica C30 for pain and infection after total abdominal hysterectomy. *J R Soc Med* 1997;90:73–78
- 16 Karpishchenko SA, Kolesnikova OM, Legkova YV. Actual considerations of post-tonsillectomy case management. *Vestn Otorinolaringol* 2019;84:94–99
- 17 Cassu RN, Collares CM, Alegre BP, Ferreira RC, Stevanin H, Bernardi CA. Analgesia e ação antiinflamatória da *Arnica montana* 12ch comparativamente ao cetoprofeno em cães. *Cienc Rural* 2011;41:1784–1789
- 18 Tsintzas D, Mahesh S, Vithoulkas G. Individualized treatment of bone marrow edema of the knee with the aid of classical homeopathy: a report of 2 cases. *Clin Med Insights Case Rep* 2020;13:1179547620904896
- 19 Mawardi H, Ghazalh S, Shehatah A, et al. Systemic use of *Arnica Montana* for the reduction of postsurgical sequelae following extraction of impacted mandibular 3rd molars: a pilot study. *Evid Based Complement Alternat Med* 2020;2020:6725175
- 20 Travagin DR, Coelho C. Use of *Papaver somniferum* and *Arnica montana* in ultra-diluted form to assist in anesthesia recovery and as analgesia for dogs having undergone ovariohysterectomy. *Homeopathy* 2020;109:A11

- 21 Iannitti T, Morales-Medina JC, Bellavite P, Rottigni V, Palmieri B. Effectiveness and safety of *Arnica montana* in post-surgical setting, pain and inflammation. *Am J Ther* 2016;23: e184–e197
- 22 Macêdo SB, Ferreira LR, Perazzo FF, Carvalho JC. Anti-inflammatory activity of *Arnica montana* 6cH: preclinical study in animals. *Homeopathy* 2004;93:84–87
- 23 Sorrentino L, Piraneo S, Riggio E, et al. Is there a role for homeopathy in breast cancer surgery? A first randomized clinical trial on treatment with *Arnica montana* to reduce post-operative seroma and bleeding in patients undergoing total mastectomy. *J Intercult Ethnopharmacol* 2017;6:1–8
- 24 Mathews KA, Pettifer G, Foster R, McDonnell W. Safety and efficacy of preoperative administration of meloxicam, compared with that of ketoprofen and butorphanol in dogs undergoing abdominal surgery. *Am J Vet Res* 2001;62:882–888
- 25 Enderg TB, Braun LD, Kuzma AB. Gastrointestinal perforation in five dogs associated with the administration of meloxicam. *Vet Emerg Crit Care* 2006;16:34–43
- 26 Monteiro-Steagall BP, Steagall PV, Lascelles BD. Systematic review of nonsteroidal anti-inflammatory drug-induced adverse effects in dogs. *J Vet Intern Med* 2013;27:1011–1019
- 27 Oliosio D, Marzotto M, Bonafini C, Brizzi M, Bellavite P. *Arnica montana* effects on gene expression in a human macrophage cell line. Evaluation by quantitative real-time PCR. *Homeopathy* 2016;105:131–147
- 28 Teixeira MZ. New homeopathic medicines: use of modern drugs according to the principle of similitude. *Homeopathy* 2011; 100:244–252