EFFECT OF INTRAMUSCULAR LIGNOCAINE INJECTION ON PROPOFOL HYPNOSIS IN DOGS

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ABSTRACT

Drug interaction has been reported to have synergism, however some have resulted in counteractive effects. The aim of this study is to look at the effect of intramuscular lignocaine on propofol hypnosis was administered intramuscularly (IM) with intravenous (IV) 1.0% propofol (Propoval®, Bhanatserums & vaccines Ltd, India), at 6mgkg^{-1}(control). The second was IM 1% lignocaine at 2.0mgkg^{-1} with IV 1.0% propofol (Propoval®, Bhanatserums & vaccines Ltd, India), at 6mgkg^{-1}. Maintenance fluid flow rate of 5mgkghr^{-1}was administered throughout the anaesthetic period for supportive. A combination of lignocaine and propofol produced a brief period of analgesia and hence a state of narcosis compare to the control. The combination produced a significantly longer time to intubation, sternal recumbency, standing and duration of hypnosis compared to the control. Concluding from the study, combination of lignocaine/ propofol enhanced the hypnotic effect of propofol and safe for use in this breed of dogs.

Keywords: Dogs, drug interaction, lignocaine, propofol.

INTRODUCTION

Polypharmacy is central to the practice of anaesthesia in both humans and animals. Pre-anaesthetic drugs may be administered to calm the patient, reduce subsequent anaesthetic doses or counteract the side effects of certain anaesthetics agents or clinical procedures (Hall, 2001).A drug-drug interaction has been defined as a change in the magnitude of pharmacological action or toxicity of a drug by another drug (Murad and Gilman, 1985).

Lignocaine is available as colourless aqueous, stable solution, with or without adraneline (1: 10,000). It is a local anaesthetic in the amide group; it is used in dogs for local tissue infiltration and nerve blocks, and the 2.0% to 4.0% solutions for topical application technique (Skard, 1996). Propofol is a sedative or anaesthetic of a short duration. Induction of anaesthesia is usually queit, smooth and excitement-free (Watkins *et al.*, 1987). Apnea is the most frequent adverse effect of propofol (Watney and Pablo, 1992). Sogebi and Adetunji (2008; 2009) reported bupivacaine (a drug in the same amide group) to have a narcotic effect on the hypnosis of thiopentone and propofol respectively. This study looks at the effect of intramuscular lignocaine on propofol hypnosis in dogs.

MATERIALS AND METHODS

Experimental Animals

Seven Nigerian indigenous dogs aged between 1.5-2.0 years with an average weight of 11.95 ±1.87kg were used for this study.They were fed standard home-based ration and water *ad-libitum*. They were allowed a period of three weeks to get acclimatized to their new environment, new feeding regime and constant human handling in readiness for the trial. The dogs were judged to be in good health based on finding at physical examination, haematology and serum chemistry profile.

Experimental design

Two series of randomised trials were carried out on each dog at one week interval. The first trial consist of intravenous administration of normal saline and and the second involve the intramuscular administration of bupivacaine and intravenous administration of thiopentone. Calculations were made for some anaesthesic indices.

Experimental protocol

Food was withheld from the animals in the morning of the experiment. Each dog was weighed for the purpose of drug dosage and was premedicated with 2mls of saline followed 40minutes later with propofol at 6mgkg^{-1}. The procedure was repeated a week later using 1.0% lignocaine at 2.0mg/kg IM instead of normal saline. Anaesthetic indices were recorded for both set of procedures from induction time to recovery.

Anaesthetic indices of the protocols incorporating the two trials was compared using paired t- test. A $P<0.05$ was accepted as statistically significant for the comparisons.

RESULTS AND DISCUSSION

Table 1 shows significantly longer time to intubation, sternal recumbency, stand and duration of hypnosis in the treated group (LIG/PROP) compared to the control (SAL/PROP) values; this is a potentiating effect of lignocaine on propofol hypnosis. This agrees with the report of Ben-Shlomo *et al.* (1997).

Normally, propofol lacks analgesia as reported by Watkins *et al.* (1987); Hall and Clarke (1991) but propofol in this study exhibits some level of analgesia, this is explained by the lignocaine used.

CONCLUSION

It is concluded that the combination of IM lignocaine with IV propofol enhanced the hypnotic effect of propofol and is safe for use in dogs. There was a definite interaction between lignocaine and propofol.

The interaction has a potentiating effect; this should be taken into consideration when this combination is to be used with volatile anaesthetic agent.

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Table 1: Anaesthetic indices of an IV induction dose of propofol after IM injection of lignocaine in dogs.

Index	SAL/PROP	LIG/PROP
Time of intubation (min)	3.4 ±0.9	3.6 ± 0.8*
Onset of analgesia (min)	-	4.4 ± 2.0*
Duration of analgesia (min)	-	5.4 ± 1.2*
Duration of intubation (min)	7.6 ± 2.0	9.8 ± 4.8
Duration of hypnosis (min)	11.0 ± 2.5	14.0 ± 4.3*
Time to sternal posture (min)	1.8 ± 0.9	3.4 ± 3.1*
Time to standing (min)	1.0 ± 0.5	2.4 ± 0.9*

Mean values with superscript in the same horizontal row are significantly different from one another at P<0.05 according to paired t-test.
KEYS: SAL – Saline, LIG. – Lignocaine, PROP. - Propofol