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EFFECTS OF ATROPINE SULPHATE PRIOR TO USAGE OF PRE ANESTHETIC AND ANESTHETICS IN DOGS

Avni Robaj[1], Afrim Hamidi[1], Driton Sylejmani[1], Rezart Postoli[2], Paskal Gjino[2]

[1]Department of Veterinary Medicine, Faculty of Agriculture and Veterinary, Prishtina, Kosovo

[2]Department of Veterinary Surgery, Faculty of Veterinary Medicine, Tirana, Albania

Abstract

In this study two protocols of anesthesia in dogs using different medicament combinations were compared for their efficiency and side effects in dogs. For this purpose dogs of different ages, races, and weight delivered for curing purposes have been involved in this study. In the first group of dogs the anaesthesia protocol comprising of xylazine as sedative substance, acepromazine as tranqulizier, ketamine as narcotic medicament IM (Intramusculuar) wereadministered, and in control group prior to application of xylazine, acepromazine, ketamine IM the atropine sulphate was administered. The goal of different combinations of medicaments with tranquilizing, sedative, narcotic and anticholinergic effect was the evaluation for better combination with fewer side effects for narcosis in ambulatory conditions. In first group, effect of mixture acepromazine + xylazine is reached after 5 $\pm$ 1,3 minutes after I/M injection, meanwhile the speed of anaesthetic induction with additional application of ketamine is reached after 3 $\pm$ 1,6 min after injection. In the second group as control group the administration of atropine sulphate 10 minutes prior injection of mixture acepromazine + xylazine and ketamine reaches the mixture effect after 4 $\pm$ 1,2 minutes from last injection I/M. Meanwhile the speed of anaesthetic induction in second group with additional application of ketamine is reached after 3 $\pm$ 1,1 minutes after injection. The combinations studied here revealed satisfactory results, assuring good anesthesia, less side effects and easy to perform in ambulatory conditions.

Key words: *xylazine, ketamine, acepromazine, atropine, dog*

INTRODUCTION

General anesthesia is a total loss of all feelings in organism. It is accompanied with annihilation of pain feeling, free movements, muscles relief and total loss of reflexes. During this retardation the essential body life activities are safe. Essentially general anesthesia affects blood circulation and smooth muscles that are located in the hindbrain. Nowadays there are many dog races that before weren't usual or were present in a very few number. Because of the lack of knowledge on breeding requirements of these dogs, many pathologies occurr and the treatment of these often requires specialized chirurgical intervention and proper anesthetic medicament combinations. Parasympatholytic medicaments or anticholinergic medicaments such as atropine, block the cholinergic muscarinic receptors, stopping muscarinic effects of acetylcholine. These substances also block muscarinic effects caused by stimulation of cholinergic nerves, mainly pre-sympathy postganglionic fibres (Isalmi and Disha, 1986). The effect of α_2-agonist substances on gastrointestinal tract may cause to some dog races extension and distortion of stomach (Gjino, 2003). Acepromazine (ACP) is known also for its neuroplegic, and ataractic effect. In this subgroup the derivation of phenothiazine is very important (Gjino, 2003). Actually agonists of α2-adrenoreceptors make an intensive research field to explore new substances suitable for anesthesia. Sedation is associated with analgesia because of the presence of adrenergic α_2 presynaptic receptors both in supraspinal level and in the dorsal horn of spinal cord (England et. al., 1992). It is considered that the reduction of cardiac rhythm and pumping quantity of blood into circulation can induce a slow flow of blood through tissues allowing absorption of the higher quantity of oxygen from tissues (Clarke and England, 1989). Some studies have demonstrated that α_2-agonistes stop antidiuretic effect through hormone released coordinated by the hypothalamus (Kimura et. al., 1981). Xylazine causes sedation and analgesia including depression in central nervous system, stimulating α_2-adrenergic receptors and reduces the sympathic effect and consequently lowering the noradrenaline release (Haskins and Klide, 1992). Ketamine as narcotic medicament might be used even on diagnostic procedures in orthopaedics, and minimizing the risks of bronchospasma in urgent interventions (Durrësi and Andoni, 1999). Effects of parasimpatholytic medicaments such as sulfate atropine are: blockage of vagus nerve stimulation to prevent the bradicardy (Alvaides et. al., 2008) reduce secretions from glandule spittle, bronchial secretions, milder the peristaltic of digestive system, dilatation of eye pupilas, and

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stop the vomiting reflects. The objective of this study was the comparison of two protocols for their efficacy comparison of the side-effects.

MATERIAL AND METHODS

This research clinical study has been carried out at the Faculty of Agriculture and Veterinary- Pristina, Kosovo with dogs from different parts of the country. Anesthetic medicaments mostly found in the market of Kosovo and Albania used in dogs and cats were used in different application combinations. In the study 20 dogs were split in two groups, 10 dogs per each group. Animals of different races (random patients) and ages within the first and second groups were selected. Pregnant bitches and surgically treated dogs were excluded from this study. The age of animals ranged from 1 to 9 years and weight from 5 to 25 kg. In the first group, firstly the combination of two xylazine 2% 1,5 mg/kg + I/m acepromazine 0,05 mg/kg was applied secondly the combination of xylazine + acepromazine + ketamine 10 % in a dose 15 mg/kg (I/M) was performed and the second group firstly atropin 0,03 mg/kg b.w. S/C (Subcutane) was applied following than application of xylazine + acepromazine without ketamine and secondly with ketamin 10% in dose 15 mg/kg (I/M). Prior to application, the animals were examined for general health conditions such as cardiovascular system, breathing, temperature, respiratory frequence, feeding and afterwards pre-anesthesia using of neuroleptic substances acepromazine and xylazine following and following with general anesthesia with ketamine in the first group whereas in the second group the sulfate Atropin as a parasympholytic substance was administered. Clinical parameters of dogs evaluated used in the study were: feeding conditions including underfed, normal, and overfed: animal behavior including apathetic, quietly, exited state: colours of mucosa including pink, congestive, and pale appearance: cardiac frequency: respiratory frequency and body temperature with rectal thermometry.

Table 1. Clinical parameters of dogs prior to application of the protocols

Clinical feature	Clinical state	Nr./Percentage
Color of mucosis	Pink	15 (75 %)
	Pale	3 (15 %),
	Congestive	2 (10 %)
Behavior	Quite	5 (25 %)
	Excited	5 (25%),
	Normal	10 (50 %)
Nutritive condition	Normal	13 (65 %),
	Underfed	4 (20 %),
	Overfed	3 (15 %)

RESULTS

The effect of combination of acepromazine + xylazine was reached after 5 minutes ($\pm$ 1,3) after I/M injection, whereas the induction of anesthesia with additional application of Ketamine was reached after 3 minutes ($\pm$ 1,6). In the second group with the application of the combination of Atropine + Acepromazine + Xylazine the anesthetic effect was reached after 4 minutes ($\pm$ 1,2) whereas the addictional application ketamine in the second time induced the anesthetic effect was reached 3 minutes ($\pm$ 1,1).

These combinations were also associated with clinical changes such as heart frequency, breathing as well as body temperature as shown in the table 3.

Table 3.Heart frequency, respiratory frequency and body temperatur average values

Time/ Parameter	Group I Parameter	Group II
Before anesthesia		
Heart frequency	79 +10	80 +12
Respiratory frequency	29	28
Body Temperature	38.5 +1.0	38.3 +1.2
Initial phase of anesthesia		
Heart frequency	78 +7	79 +10
Respiratory frequency	24	26
Body Temperature	38.3 +0.8	38.5 +0.9
10 minutes after anesthesia		
Heart freq. in the	70 +9	76 +8
Respiratory frequency	22	23
Body Temperature	37.2 +0.9	37.7 +0.8
20 minute after anesthesia		
Heart freq. in the	60 +5	74 +4
Respiratory frequency	20	20
Body Temperature	37.0+0.7	37.3+0.7
30 minutes after anesthesia		
Heart freq. in the	62 +2	70 +0.8
Respiratory frequency	20	20
Body Temperature	36.5 +0.9	36.9 +0.4
40 minutes after anesthesia		
Heart freq. in the	61 +8	68 +5
Respiratory frequency	22	23
Body Temperature	36.3 +0.3	36.8 +0.7
Awakening time		
Heart freq. in the	62 +5	66 +1.2
Respiratory frequency	24	25
Body Temperature	36.1 +0.7	36.7 +0.8

Cardiac frequency reduction was observed in both groups but predominantly expressed on first group and less in the second group. The bradychardy was registered after application of xylazine with increasing tendency after application of ketamine, (Rings D.M.et al). In the first group a higher variation from average values was registered. Reducing of respiratory frequencies observed in both groups with lower values in the first group Lower respiratory frequency values were registered after 20 minutes following the narcosis. Lower hypothermia was registered in both groups reaching the lowets values after 30-40 minutes after narcosis, whereas in the first group slightly lower values were registered..

Using different combinations revealed also different data regarding the duration of anesthesia and the awakening time. In the first group the combination of xylazine, acepromazine following ketamine application revealed an anesthetic effect for 52 $\pm$ 7 minuta and awakening time of 25 minutes ($\pm$ 12) after the anesthetic effect was terminated. In the second group the combination of xylazine, acepromazine following ketamine application with prior application of atropine revealed an anesthetic effect for 65 minutes ($\pm$ 4) and awakening time of (28 $\pm$ 15) after the anesthetic effects was terminated.

DISCUSSION

In the first group anesthesia lasted 52 ± 7 min, and in the second group 65 ± 4 minutes. Prolongation of anesthesia in the second group confirms synergistic effects of xylazine with acepromazine, even the half of the dose is applied the anaesthetic effect is maintained in good conditions. Combination of two pre-anesthetic medicaments allows the dosage reduction of xylazine with ACP without affecting in the quality of anesthesia. Monitoring of anaesthesia consists on control of cardiac and respirator frequency, excitement and body temperature. Based on the results the second group revealed higher rate of heart frequency. Using of atropine s/c 10 minutes before pre-anesthesia positively impacts the heart freqeuncy and breathing, (Muir W.W. (1978) . During anesthesia in dogs the temperature entirely gets reduced under the normal values. This shows the hypothermic effect of Acepromazine and xylazine and this data also are supported by others authors that the dosis does not affect the temperature, (Thurmon, J.C. and al). The vomiting effect is often observed is frequently present because using the pre anesthesia and ketamine. It can be observed in most of the cases unplanned narcoses whereas during administration of acepromazine and xylazine the vomiting effect is barely or not present at all. In our study the vomiting effect was not observed observed only in one dog (10 %) due to probably atropine effect. Further studies would help to determine the xylzine effect on body thermoregulation ability in association with environmental conditions as supported by other authors about medetomidine (Clarke dhe England, 1998).

CONCLUSION

Precursory usage of atropine realizes narcoses with a better quality and avoids vomiting effect and its consequences. Based on the acquired data from this research it can be concluded that combinations used in the second group assure safer and healthier anesthesia. Therefore, the application of atropine is advisable subsequently followed by application combination of xylazine + acepromazine after 10-15 min and finally the induction of narcoses with ketamine administration. In absence of inhalation anesthesia this protocol results more successful and safer.

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