

SURVEY OF DOG AND CAT ANESTHESIA IN UNIVERSITY VETERINARY HOSPITAL PROFESSOR ALIN BÎRȚOIU

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Abstract

The aim of this study is the survey of current anesthesia cases and outcomes for dogs and cats in the University Veterinary Hospital Professor Alin Bîrțoiu, Bucharest, during 12 months, in order to improve anesthesia safety and education. Electronic medical records for patients were examined and 944 cases of dogs and cats that underwent general anesthesia (including sedation) assigned for ASA I-V risk classes, including emergencies were selected. The total mortality rates considered anesthetic-related death in dogs and cats (deaths in the first 48 hours attributable to anesthesia) were respectively 0.29% for dogs and 0.76 % for cats. The species, rase, sex and age structure of the case log were analyzed according to the type of the technique (injectable 12% or inhalation 88%). All the cases were preanesthetic evaluated and monitored during anesthesia and recovery.

Key words: anesthesia, survey, veterinary

The aim of this study is the survey of current anesthesia practices and outcomes for dogs and cats in the University Veterinary Hospital Professor Alin Bîrțoiu, Bucharest and to compare the results with other studies cited in literature. Large veterinary multicenter studies defined anesthesia-related death, for small animals, as occurring within 48 h after a procedure, where anesthesia could not be excluded as being one of the contributory factors, with an overall 4% in cats (Portier, 2020). Other studies are presenting lower anesthetic-related death (ARD) rate as 0.11% for cats and 0.05% for dogs (Matthews, 2017).

A multi-center small animal practice-based study, was undertaken in the UK and 98,036 anesthetics and sedations were recorded in dogs and 79,178 in cats (Brodblet, 2008). The risk of ARD was approximately 0.17% in dogs and 0.24% in cats, respectively 0.05% and 0.11% in healthy dogs and cats (ASA 1–2) versus >1% in sick patients (ASA 3–5).

Increasing age was associated with increased odds of death for both species. The results may be useful for the improvement of the anesthesia techniques in order to reduce anesthetic-related death.

Having the profile of the most frequent patients and results regarding their vital prognosis after anesthesia, can help us to adjust the protocols in order to decrease the risks and the mortality and to continue to study all the factors involved in peri-anesthetic period.

MATERIAL AND METHOD

This study was conducted on 944 cases of dogs and cats that underwent general anesthesia (including sedation) assigned for ASA I-V risk classes and emergencies. The cases were presented in the University Veterinary Hospital Professor Alin Bîrțoiu, Bucharest, during 12 months.

The ratio between canine and feline cases was 72.03%/ 27.97%, ages between 9 months and 17 years. Pre-anesthetic evaluation was performed for all cases in order to identify individual risk factors and to classify the risks prior to anesthesia.

Patient anesthesia risk was assessed according to American Society of Anesthesiologists (ASA) physical status classification system modified from the American Society of Anesthesiologists (Costea, 2016), shown to be a valuable prognostic tool, recommended to identify an increased risk of ARD until 24–72 hours after anesthesia (Portier, 2018). Checklists were used for each case., as they are shown to decrease ARD and reduce complications in veterinary practices (Haynes, 2009; Bergstrom, 2016). Various injectable (total intravenous anesthesia, intramuscularly sedation) and gaseous techniques, maintenance with Isoflurane) were used for the cases admitted in this study, according to the individual characteristics and procedures.

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Injectable protocols were used exclusively for unique sedation in ASA I-II cases or for general anesthesia in ASA I cases (normal healthy patient, with no organic disease- neutering).

Inhalant anesthesia protocols were used for ASA II-V (patient with mild systemic disease, severe systemic disease compensated/decompensated, moribund patient) and emergency cases that require general anesthesia.

RESULTS AND DISCUSSIONS

This study covers the case portfolio of anesthesia (canine, feline) during 12 months, at the University Veterinary Hospital Professor Alin Bîrtoiu, Bucharest, which can be described as a referral emergency center for the entire south area of Romania. Most of the cases from this study are referred from small clinics or may come directly as emergencies or as critical cases. Another part of cases is referred for advanced imaging diagnostic (magnetic resonance imaging, computed tomography, radiology, ultrasound) that requires in some situation sedation or general anesthesia.

The age structure (Table 1) for the 944 cases of dogs and cats is presented in Table 1. For dogs the largest number of cases were included in the age interval 6-12 years (41.67%) while for cats the largest interval was 1-6 years (46.43%). The number of cases over 12 years of age in cats exceeded the dog's category (14.28% over 9.72%).

Regarding breed distribution of cases (Table 2), 12.2% of dogs were registered as Metis (canine mixed breed), while for cats 64.29 % were European (feline mixed breed). A group of 13.95% of dog were brachycephalic breeds (French Bulldog, Pug), known to have a high anesthetic risk. Brachycephalic cats, also considered difficult patients for anesthesia, represented 14.28% of the cases (British shorthair, Scottish Fold). All the brachycephalic cases were intubated for general anesthesia (cases ASA II-IV).

Comparing the total number of cases for this survey, the results showed that 88.03 % of the techniques represented gaseous (inhalation) anesthesia, compared with 11.97 % injectable protocols. 8.24 % (56) of dog's cases and 21.59 % (57) of cat's cases represented injectable protocols (Table 3).

The higher percentage of injectable protocols in cats compared with dogs can be correlated with the higher number of sedations required, due to their aggressivity or lack of compliance during clinical procedures.

From the total number of cases, injectable anesthesia protocols represented 11.97 % (113). No ARD cases were recorded for this category of cases: young ASA I patients, anesthetized for elective sterilizations or sedations for ASA I-II.

ASA cases higher than III can have a significantly increased risk of complications, since the ASA status rather than age is a better predictor of peri anesthetic complications (Hosgood, 2002).

A total of 88.03% (831) represented inhalations protocols for ASA II-V patients (patients with different types of pathologies) and emergency cases, respectively 91.76% (624) of dog's cases and 78.41 % (207) of cat's cases (Table 3).

The ARD cases represented a total of 0.42% from the entire number of cases and respectively 0.29% for dog's cases and 0.76% for cat's cases (Figure 1).

All of the ARD cases were anesthetized by inhalation protocols and represented ASA II-V and emergency cases. Breed was not one of the factors involved in the ARD for these 4 cases (Table 1).

Differentiated results by species are not favorable for cats, were ARD recorded were higher than for dogs (0.97% versus 0.32%) and similar to other studies. Differences between ARD percentages for dogs and cats are correlated with the possible complications during anesthesia that are more common in cats than dogs. Data from bibliography (Brodblet, 2008) present results of >1% ARD for patients with different pathologies compared with this study's results, that show lower ARD for the group of cases ASA II-V and emergency cases (0.48%).

The results of this study show an increased rate of ARD for the total number of cases and types of anesthesia, compared with literature data, but important differences are observed between the specific of cases according to different types of cases covered (primary care veterinary practices, basic clinics, referral centers, teaching hospitals, referrals, emergency hospitals).

Table 1

Cases- age structure

Canine cases age interval/ %		ARD canine	Feline cases age interval/ %		ARD feline
0-12 months	12.5%		0-12 months	2 %	
1-6 years	36.11%	1 case-neurological case MRI scan (French Bulldog, ASA III)	1-6 years	46.43 %	2 cases- acute traumas (European cats, ASA IV)
6-12 years	41.67%		6-12 years	14.29 %	
12-15 years	9.72 %	1 case- pyometra (Pekinese, ASA IV)	12-15 years	10.71%	
			15-18 years	3.57%	
From 680 cases		0.29%	From 264 cases		0.76%
TOTAL 944 cases	0.42% (4 cases)				

Table 2

Cases- breed structure

Canine		Feline	
Metis	12.20%	European	64.29%
Havanese Bichon	11.11%	British Shorthair	10.71%
French Bulldog	9.72%	Sphynx	7.14%
Maltese Bichon	5.56%	Birman	5.14%
Beagle	4.27%	Maine Coon	3.14%
Pug	4.23%	Scottish Fold	3.57%
Labrador Retriever	4.21%	Other breeds < 2%	
Other breeds < 2%			

Table 3

Injectable versus inhalation cases and the mortality cases (ARD)

Cases	Injectable		Inhalation	
	ARD	%	ARD	%
Canine (680)	0	8.24 % (56)	2	91.76% (624)
Feline (264)	0	21.59 % (57)	22	78.41 % (207)
TOTAL (944)	0	11.97 % (113)	42	88.03% (831)

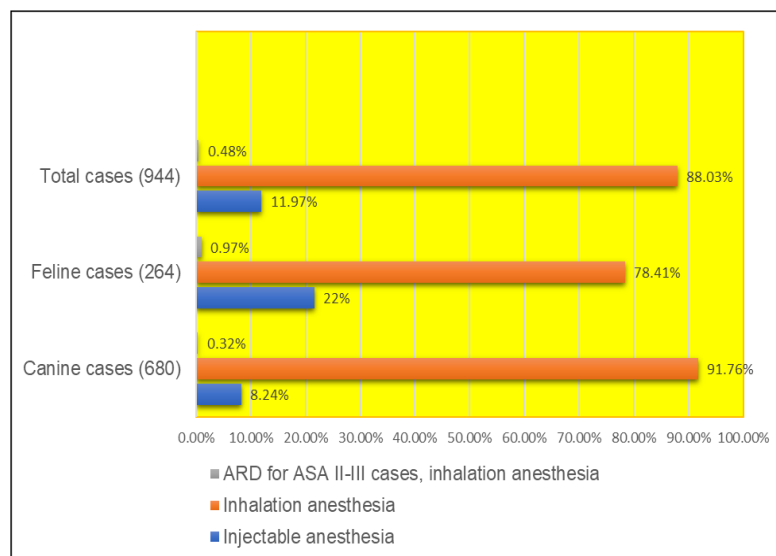


Figure 1. Differentiated results by species

CONCLUSIONS

The results obtained in this study describe the type of anesthesia techniques used for different species (canine, feline) breeds and age groups, as well as the mortality rate associated with anesthesia, in an emergency veterinary service.

Given that most of the dogs in the group are in the age range 6-12 years (41.67%) and brachycephalic breeds accounted for 13.95% of canine cases, the ARD rate was 0.32% and recorded exclusively in patients with acute pathologies (ASA III, ASA IV). None of the ARD were related to any breed risk factor for anesthesia. Brachycephalic cats, also considered difficult patients for anesthesia, represented 14.28% of the cases and no ARD were recorded for this category.

From the total number of cases, injectable anesthesia protocols represented 11.97% (113 cases ASA I, ASA II) compared with 88.03% (831 cases ASA II-V, emergency) inhalations protocols. For feline patients it was recorded a higher number of injectable protocols compared with canine patients (21.59% versus 8.24%), correlated with the higher number of sedations required for diagnostic procedures in their case while canine cases were subjected to a higher percentage of general anesthesia compared to injectable sedations.

All of the ARD cases were anesthetized by inhalation protocols for ASA II-V and emergency cases and represented a total of 0.42% from the entire number of cases (0.29% canine, 0.76% feline), respectively 0.48% only for the inhalational group, with a higher percentage for feline patients (0.97% versus 0.32%).

Anesthesia for patients with different pathologies in University Veterinary Hospital Professor Alin Bîrțoiu, Bucharest, registered lower ARD compared with other studies (0.48% versus 1%). The ARD for the total number of cases and types of anesthesia, should also be analyzed considering the important differences between the specific of cases of an emergency referral hospital compared with other types of studies and veterinary practices.

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