

The attitude of veterinarians towards transfusion medicine and determination of donor potentials of cats and dogs in Istanbul / Turkey

Research Article

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ABSTRACT

The demand for blood products increases day by day due to the developments in animal transfusion medicine. Therefore, new strategies are developed to create adequate sources. It was observed that animal owners who came to our small animal blood bank are generally wary of the voluntary donor program, and both theoretical and practical information about transfusion medicine are requested by the veterinarians. In the present study, the knowledge and perspectives of the veterinarians on animal blood banking and blood transfusion have been surveyed by a questionnaire. The awareness of the veterinarians and the pet owners has been raised by means of meetings and brochures. Additionally the donor potential of the pets, which were brought to the clinics, has been investigated; and the ratios were 52 % and 45 % for the dogs and cats, respectively. The blood typing has been performed for the animals, which are suitable for blood donation, and a "living" blood bank has been developed.

Keywords: blood bank, cat, dog, donor potential

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Introduction

With the development of veterinary transfusion medicine, demand for blood products has rapidly increased and new strategies have been developed to create adequate supply (Battaglia, 2001; De Luca et al., 2006; Feldman and Sink, 2006; Kirstensen and Feldman, 1995). Animal blood banks established for this purpose provide blood-based products for veterinary practitioners (Holahan, 2008; Luca et al., 2004). Blood transfusion is a challenging process both technically and financially (Battaglia, 2001; Holahan, 2008; Howard et al., 1992). Some pet blood banks or animal hospitals in certain countries have an in-house shelter for their own feline and canine donors (Battaglia, 2001; De Luca et al., 2006; Dodds, 1993; Hohenhaus, 1992; Kristensen and Feldman, 1995) or they execute voluntary blood donation programs (Bücheler and Cotter, 1992; De Luca et al., 2006) to meet the demand for blood products. The advantages of a closed colony donation system are

being able to keep the animals under control, which reduces the risk for contamination by blood transfusion and availability of sustainable and predictable blood supply. On the other hand, the relevant system requires additional precautions and expenses like maintaining high ethical standards and taking care of the donor animals (De Luca et al., 2006; Wardrop et al., 2005). The closed system brought along ethical issues like violation of animal welfare. Restriction of the donation period and reducing the frequency of transfusion intervals has been suggested so as to cease the ethical debates (Battaglia, 2001; De Luca et al., 2006). It has been asserted that a voluntary donation program and participation of a large number of owners could be an alternative to the closed colony system (Feldman and Sink, 2006; Wardrop et al., 2005) however, the risk of infection due to contamination, blood type incompatibility, the lack of sustainable donation and the reluctance of the owners restrain the efficiency of the system. (Altundag et al., 2009; De Luca et al., 2006). The

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safety of the products depends on the health status of the donors as well as the techniques and equipments used and also the storage conditions (Holahan, 2008). Ehrlichiosis (Erdeger et al., 2003) and Leishmaniasis (Aslantas et al., 2005; Ozbel et al., 2000) which are widespread infections in captive, stray and owned animals in our country and Lyme Disease (Gulanber et al., 2007), despite its rarity, pose risk for transfusion. Hence, parasites were detected in 40% of blood samples collected from animal shelters and the majority of the animals were too anemic to be a donor (Arslan M., unpublished observation). Anemia due to either nutritional deficiencies or other factors cause serious health problems in stray animals and on that account it poses a great risk to use stray, captive or other animals on which no hematological or parasitic tests were done, as donors for blood transfusion (Owens et al., 2001; Reine, 2004; Wardrop et al., 2005).

Small animal clinics attempt to provide their blood supply from stray or owned animals. Usually, no hematological tests are carried out to assess the blood compatibility or to find out whether there is a chronic disease to hamper the donation. Random transfusion is usually known to induce complications including life-threatening conditions in the recipient (Giger et al., 1995). Besides, usage of whole blood instead of a specific blood component therapy causes serious complications in animals with liver or kidney failure or in geriatric animals (Chiaromonte, 2004; Jutkowitz, 2004). Blood component therapy is superior to whole blood transfusion and provides significant advantages for practitioners (Rozanski and Laforcade, 2004; Stone et al., 1992).

Blood donation by various methods is being accepted in our animal blood bank which has been active since 2006. Despite the increase in blood donation, it is far from meeting the demand. Although there are 450 veterinary clinics, polyclinics and hospitals currently available in Istanbul, the donation program draws low attention. Despite the rapidly growing veterinary transfusion medicine, no studies were carried out in our country demonstrating the clinical and physiological data of the potential donors that are capable of meeting the demand for blood products. The purpose of the study was to assess the donor potential of the cats and dogs that were referred

to the clinics of Istanbul and to determine the approach of veterinary practitioners towards blood transfusion and animal blood banking.

Material and Methods

Material: The questionnaire and other documents were sent out to the authorized veterinary clinics, polyclinics and hospitals in Istanbul. Dogs and cats meeting the criteria for blood donation were detected by a throughout survey.

Questionnaire: The opinions and perceptions of the practitioners regarding the blood transfusion were surveyed by a questionnaire (Figure 1)

Determination of the donors: Voluntary cats and dogs meeting the criteria for blood donation were identified by a survey study and included in the program (Battaglia, 2001; Lanevschi and Wardrop, 2001). Hematocrit values of the blood samples collected in vacuum tubes were assessed by microhematocrit method. The animals meeting the following criteria were selected as donors: Dogs= 1-8 year-old, at least 30 kg, hematocrit value of minimum 40%, in a good physical condition, received no transfusion before and well-tempered. Cats = > 6-month-old, at least 4.5 kg, hematocrit value of minimum 35%, in a good physical condition and well-tempered. Besides, all donors were selected among regularly vaccinated, untreated and healthy (no cardiac and renal conditions) animals (Holahan, 2008; Lanevschi and Wardrop, 2001).

Blood samples of animals eligible for donation were collected in EDTA tubes. Blood typing was done and the bloods were certificated. The experimental procedure of the study was approved by Istanbul University Animal Experiments Local Ethics Committee.

Statistical Analysis: Donor potential of the animals (80 dogs and 80 cats) included in the survey study was determined as percentage values in terms of the required criteria.

Results

Survey Study: Percentage values of the answers with respect to blood transfusion of 280 veterinary practitioners who had been practicing for more than 7 years to the 6 question survey were given in Figure 1.

Determination of the donors: Percentage values of the tested dogs regarding the criteria for blood donation

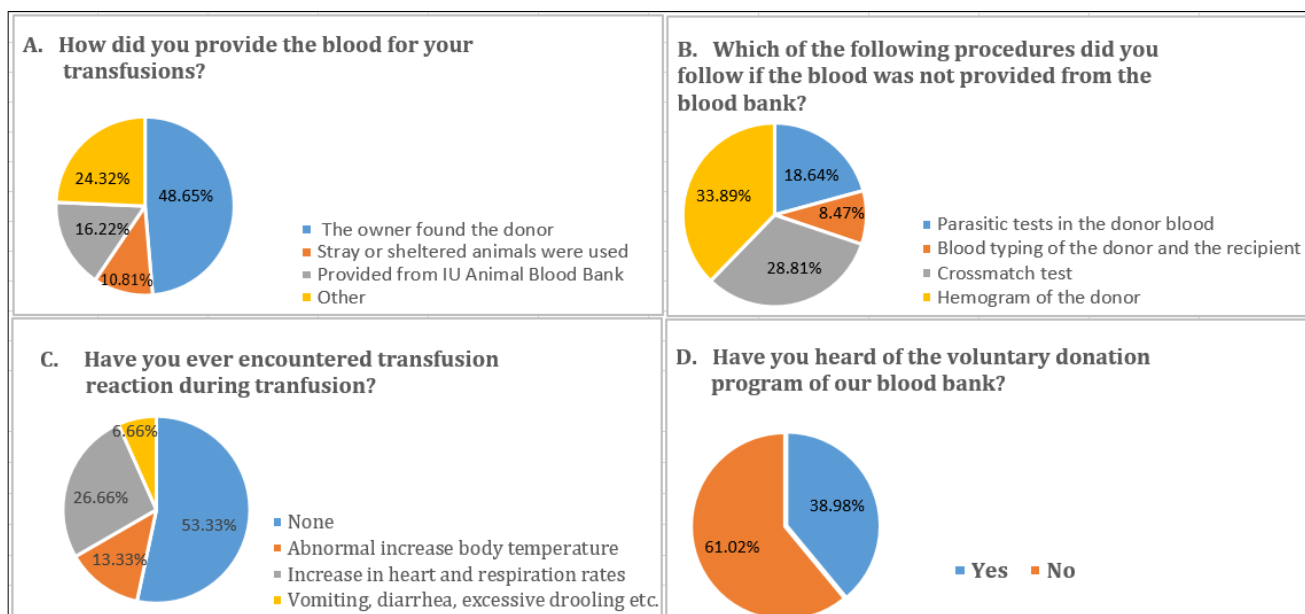


Figure 1: Results of blood transfusion and blood banking survey

were given in Table 1 and Table 2. Percentage values of cats tested for donation criteria were given in Table 3 and Table 4.

Discussion and Conclusion

Results of blood transfusion and blood banking survey were given in Figure 1. The questionnaire put forward significant information about why blood donation did not increase at an expected rate although there is an animal blood bank available in our country. According to the results of the survey, 62.69% of the participants

Table 1. Propriety with donor dog criteria (%)

Question	Yes	No
Is he/she fertile? (n=28)	21.4	78.6
Is he/she regularly vaccinated?	0	100
Does he/she receive anti-parasitic prophylaxis?	0	100
Has she ever had a pregnancy? (n=28)	17.8	81.2
Has he/she ever donated blood?	0	100
Has he/she ever had a surgical procedure?	0	100
Does he/she have a clotting disorder?	0	100
Has he/she ever had a heart disease?	0	100
Has he/she ever had a liver disease?	0	100
Has he/she ever had a kidney disease?	0	100
Has he/she ever had blood transfusion?	0	100
Does he/she have diabetes?	0	100
Does he/she have epilepsy?	0	100
Has he/she ever had blood parasites?	0	100

had been practicing for more than 7 years and only 63.64% of them needed blood donation less than their patient circulation. However, infection by blood parasites (Aslantas et al. 2005; Ozbel et al. 2000; Cetinkaya et al., 2016b) is a widespread health problem in our country with Ehrlichia being in the first place (Erdeger et al., 2003 and Cetinkaya et al., 2016a), and there are outbreaks particularly in certain months. A large number of surgical procedures are being performed in 550 veterinary units in Istanbul and considering the miscellaneous clotting disorders in animals demand for blood transfusion is expected to be huge. According to the results of the questionnaire, 48.65% of veterinary practitioners who performed blood transfusion before used donor animals which the owners supplied and only 16.22 % used blood products from the blood bank (Figure 1-A). It is obvious that the majority of the veterinarians ignored the criteria for blood donation (Figure 1-A). For instance only 18.64% tested the donors for blood parasites and besides, blood typing in the donors and recipients and cross comparison were done by 8.47% and 28.81%, respectively (Figure 1-B). Blood transfusion is a highly risky procedure for blood borne infections and blood incompatibility may cause several life threatening health problems (De Luca et al., 2006). And hence, 6.66% encountered transfusion reactions (Figure 1-C). In our country, it is known that veterinarians who have performed blood transfusion in dogs give blood

randomly without blood typing in the first transfusion since dogs lack natural antibodies. However, this may pose a great risk at repeated transfusions. (Giger et al.,1995). The majority (61.02%) of the participants of the survey was not aware of the voluntary donor programme of our blood bank (Figure 1-D). The veterinarians who heard of it were often inclined to inform the owners about blood transfusion and blood banking. It can be deduced that this survey study was of great importance in raising awareness of veterinarians with respect to blood transfusion and blood banking.

Table 2. Propriety with donor dog criteria (%)

Temperament	Restless	Calm
	50	50
Sex	Male	Female
	52	48
Blood type	DEA 1.1 (-)	DEA 1.1 (+)
	52	48
Live weight	Less than 30 kg	Over than 30 kg
	45 %	55 %
Hematocrit value	Less than 40 %	Over than 40 %
	35	65
Age (Years)	Not in a range of 1-8-year-old	1- 8-year-old
	9	91

Percentage values of the dogs tested for donor eligibility criteria were shown in Table 1 and Table 2. Nine percent of the surveyed dogs were not in an age range of 1-8-year-old.

Table 3. Propriety with donor cat criteria (%)

Question	Yes	No
Is he/she fertile? (n=20)	25	75
Is he/she regularly vaccinated?	45	55
Does he/she receive anti-parasitic prophylaxis?	11.1	88.8
Has she ever had a pregnancy? (n=20)	44.4	55.5
Has he/she ever donated blood?	0	100
Has he/she ever had a surgical procedure?	0	100
Does he/she have a clotting disorder?	0	100
Has he/she ever had a heart disease?	0	100
Has he/she ever had a liver disease?	0	100
Has he/she ever had a kidney disease?	0	100
Has he/she ever had blood transfusion?	0	100
Does he/she have diabetes?	0	100
Does he/she have epilepsy?	0	100
Has he/she ever had blood parasites?	0	100
FIV	0	100
FelV	0	100
FIP	0	100

Forty five percent of the animals who met this criterion failed in terms of live body weight and 35% were infeasible regarding the hematocrit value. The dogs were considerably suitable for donation with regard to the rest of the criteria (Table 2).The latter was an expected finding since all these animals were routinely referred to the clinics and received prophylaxis. In terms of temperament, 50% of the dogs were found to be calm (Table 2). The restless half also proved to be eligible for blood collection in the presence of their owners. Therefore, all dogs were accepted as potential

Table 4. Propriety with donor cat criteria (%)

Temperament	Restless	Calm
	38.89	61.11
Sex	Male	Female
	55.56	44.44
Blood type	A	B
	38.88	61.12
Live weight	Less than 4.5 kg	Over than 4.5 kg
	30.5	69.5
Hematocrit value	Less than 35 %	Over than 35 %
	33.6	66.4
Age (Years)	Younger than month old	Older than month old
	25	75

donors in terms of temperament. The dogs surveyed in terms of gender revealed that 52% consisted of males while 48% were females. Until quite recently, only males were approved as eligible donors because females with a history of pregnancy were thought to pose a risk for donation (Hohenhaus, 1992). Later, in a study it was proved that pregnancy did not induce sensitization against erythrocytes and therefore females could also be used as donors (Blais et al., 2009).

As for potential donor dogs, the proportion of potential donors meeting all the criteria tested among dogs with an age range of 1 to 8 was 52%. This ratio had the potential to become a major source of blood. Similar findings were obtained for cats (Table 3, Table 4). However, it was found that the vaccination program was not applied as regularly as was done in dogs (55%) and anti-parasite prophylaxis was neglected in the majority (88.89%). Veterinarians are aware of the fact that the cat owners do not to take prophylactic treatments seriously since cats are usually indoor animals. However, it is of great importance to ensure that potential feline donors regularly receive anti-parasite prophylaxis. According to the survey, the

Regular vaccination is highly likely to increase this amount. For this purpose, a voluntary donation program run among owned and indoor animals was considered to be more feasible in terms of animal welfare and in order to provide more controllable blood supply. However, risk of contamination, blood incompatibility, the lack of sustainability of donations and the reluctance of the owners proved to be the disadvantages of this model. (De Luca et al., 2006). On the basis of our findings, we consider that regular follow-up of the patients will reduce the risks of this model. Potential feline donors also must be subjected to routine clinical controls and regularly vaccinated.

In the present study, the results demonstrated that even the experienced clinicians had inadequate information about transfusion medicine and thus transfusion application remained at a very low rate. It was detected that pre-transfusion compatibility testing had usually been neglected by the practitioners. While more than half of the dogs met the criteria of donation which accordingly constituted an invaluable blood supply, conformity rate to the donor criteria were low in cats due to the lack of regularly applied vaccination programs. We consider that increasing trainings in newly developed transfusion medicine in our country and increasing awareness regarding blood donation through veterinarians will accelerate the development.

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