

Different fasting periods in tiletamine-zolazepam-anesthetized cats: Glycemia, recovery, blood-gas and cardiopulmonary parameters

[Diferentes períodos de jejum em gatos anestesiados com tiletamina-zolazepam: Glicemia, recuperação, parâmetros hematológicos e cardiopulmonares]

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ABSTRACT

The effects of different fasting periods on glycemia levels and on cardiopulmonary parameters in tiletamine-zolazepam-anesthetized cats were evaluated. Twenty one animals were randomly assigned to three groups: 8 hours (G8), 12 hours (G12) or 18 hours (G18) of the preoperative fasting. The tiletamine-zolazepam (2 mg/kg) was administered intravenously. The heart rate (HR), respiratory rate (f_R), rectal temperature (T_R), glycemia (G), laboratorial glycemia (G_{lab}), venous oxygen partial pressure (PvO_2), venous carbon dioxide partial pressure ($PvCO_2$), venous hemoglobin saturation (SvO_2), pH, base deficit (BD), bicarbonate concentration (HCO_3^-) and haematocrit were evaluated at 90 minutes after the last meal (T_0), immediately before anesthesia (T_1) and at ten (T_2) and thirty (T_3) minutes after tiletamine-zolazepam administration. The time between the administration of anesthetic and the cat's trial to elevate head (Th) and the interval between drug administration and animal's quadrupedal position (T_{pq}) were recorded. No differences among groups were recorded for glycemia, HR, PvO_2 , SvO_2 , pH, BD, HCO_3^- , Ht and T_{pq} . In G12 from T_2 , glycemia increased and from T_1 $PvCO_2$ decreased. At T_1 , PvO_2 increased in all groups. In G8 and G12, from T_1 , DB and HCO_3^- decreased. In G12 and G18, from T_2 , Ht decreased. In G12, the Th mean was higher than G8. In conclusion, in tiletamine-zolazepam-anesthetized cats, the different preoperative fasting did not influence glycemia, blood-gas and cardiopulmonary parameters. Additionally, there was no relationship between glycemia and anesthesia recovery.

Keywords: cats, dissociative anesthesia, glycemia, monitoring, recovery

RESUMO

Avaliaram-se os efeitos de diferentes períodos de jejum sobre os níveis glicêmicos e os parâmetros cardiopulmonares em gatos anestesiados com tiletamina-zolazepam. Vinte um animais foram distribuídos aleatoriamente em três grupos diferenciados entre si pelo período de jejum: oito horas (G8), doze horas (G12) e dezoito horas (G18). A tiletamina-zolazepam (2mg/kg) foi administrada por via intravenosa. A frequência cardíaca (FC), frequência respiratória (f_R), temperatura retal (T_R), glicemia, glicemia laboratorial (G_{lab}), pressões parciais de oxigênio (PvO_2) e dióxido de carbono ($PvCO_2$) no sangue venoso, saturação de hemoglobina do sangue venoso (SvO_2), pH, déficit de base (DB), bicarbonato (HCO_3^-) e hematócrito (Ht) foram mensurados 90 minutos após a última refeição (T_0), imediatamente antes da anestesia (T_1) e 10 (T_2) e 30 (T_3) minutos após a administração do anestésico. Foram avaliados os períodos entre a administração do anestésico e a tentativa dos gatos de levantar a cabeça (Th) e o intervalo de tempo entre a administração do anestésico e o posicionamento quadrupedal (T_{pq}) do animal. Diferenças entre os grupos não foram registradas para glicemia, HR, PvO_2 , SvO_2 , pH, BD, HCO_3^- , Ht e T_{pq} . No G12, a partir de T_1 e T_2 , a $PvCO_2$ diminuiu e a glicemia aumentou, respectivamente. No G8 e G12, a partir de T_1 , DB e HCO_3^- diminuíram. No G12 e no G18, a partir de T_2 , Ht diminuiu. O Th no G12 foi maior que no G8. Conclui-se que, em gatos anestesiados com tiletamina-zolazepam, os diferentes períodos de jejum não influenciaram na glicemia, nos parâmetros hemagossométricos e cardiopulmonares. Adicionalmente, não há correlação entre a glicemia e a recuperação anestésica.

Palavras-chave: anestesia dissociativa, gatos, glicemia, monitoramento, recuperação

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INTRODUCTION

Too often operations are undertaken with inadequate patient preparation (Muir, 2007). Fasting reduces the chance of vomiting in the perioperative period and the associated concern of aspiration (Dyson, 1994). Besides, the distended stomach may interfere with the free movement of the diaphragm muscle and hinder breathing. The increase of intestinal volume may impair breathing, because it can promote a cranial motion of visceral mass compressing the diaphragm (Ambrósio, 2002).

Thus, with most types of anesthesia, it is best to have patients off feed for 12h before the procedure. It should be recalled that some species are adversely affected by fasting (Muir, 2007). According to Dyson (1994), whenever possible, cats should have food withheld for 8-12 hours prior to anesthesia. While for Bednarski (2007), healthy dogs and cats should be fasted at least 6 hours prior to being anesthetized. A much shorter period of starvation of 1-2h is recommended for young cats, below 3 weeks of age (Dyson, 1994), or dogs and cats below 8 weeks old and those weighing less than 2kg (Bednarski, 2007). For cats, water is usually freely available before anaesthesia (Dyson, 1994).

During fasting, in healthy animal the body compensates for this calorie deficit in the short term by first utilizing hepatic glycogen and then by mobilizing amino acids from the muscle. Glycogen stores are rapidly depleted, particularly in carnivores such as cats (Freeman and Chan, 2006). However, prolonged fasting may also produce dehydration, hypovolemia and hypoglycemia (Green *et al.*, 1996).

In halothane-anesthetized dogs submitted to fasting of 12, 18 and 24 hours, Guimarães *et al.* (2007) concluded that with 12 hours of preoperative fasting, animals showed a higher rise in glycemia levels in recovery anesthesia, but solid fasting of the 18 hours is recommended to ensure a complete absence of the solid food content in the stomach. Additionally, these authors affirmed that during anesthesia the cardiopulmonary parameters were not influenced by preoperative fasting periods.

Conversely, in dogs maintained in different preoperative fasting periods (6 to 8 hours, 12 to 14

hours, more than 16 hours) and anesthetized with halothane, no differences were observed among the three starvation times considering the glycemia value before and after anesthesia (Nogueira *et al.*, 2003).

However, there was no information on the correlation of the different fasting periods with plasma glycemia in cats. Therefore, this study was designed to assess the effects of three different fasting times on glycemia levels, cardiopulmonary parameters and recovery in tiletamine-zolezepam-anesthetized cats.

MATERIALS AND METHODS

This study was approved by the Institutional Ethics and Animal Welfare Committee with protocol n° 023593/11.

Twenty one mature mongrel cats, nine males and twelve females were enrolled in the study. All animals were determined healthy based on clinical and laboratorial evaluation. Blood, urine, electrocardiogram and thoracic radiography exams were all done. They were provided with water and regular cat food and kept in individual cages at the Veterinary Teaching Hospital.

The cats were randomly assigned to one of three groups: 8 hours (G8, n=7, 4.3±0.5kg), 12 hours (G12, n=7, 4.1±0.4kg) or 18 hours (G18, n=7, 4.2±0.7kg) of preoperative fasting. Before anesthesia, all animals were submitted to radiography exams to detect the presence or absence of food in the stomach and intestine.

The catheter was placed in the right and left cephalic vein to administer anesthesia and to obtain venous blood in order to evaluate the amount of haematocrit (Ht) (Abovet da ABX, abc Pach LMGE Montpellier, São Paulo, Brazil), venous carbon dioxide partial pressure (PvCO₂), venous oxygen partial pressure (PvO₂), venous hemoglobin saturation (SvO₂) and pH. The blood gas and pH measurements were corrected for rectal temperature (T_R °C) measured with a digital thermometer. The blood gas analyzer (Roche Omni C blood gas analyzer; Roche Diagnostics, Mannheim, Germany) calculated base deficit (BD) and bicarbonate concentration (HCO₃⁻). The 0.3mL of venous blood was collected in a syringe (1 mL) with heparin.

Different fasting periods...

In each cat capillary samples were collected from the inner pinna and glycemia (G) was measured from the same drop of blood with the Optium Xceed® (Optium Xceed, Abbot Laboratories Limited, England, United Kingdom) meters at random order. At the same time, a peripheral blood sample was collected and 1 glycemia level (G_{lab}) was measured with the reference method (Labquest, Labtest diagnóstica S/A, Lagoa Santa, Minas Gerais, Brasil).

Then, tiletamine-zolezepam (Zoletil 50, Virbac do Brasil Indústria e Comércio Ltda, São Paulo, São Paulo, Brazil) was administered at 2mg/kg intravenously. The endotracheal intubation was performed and cats were breathing room air. The animals were positioned on right lateral recumbency until they assumed a quadrupedal position.

Heart rate (HR) in beats minute⁻¹ was measured using a stethoscope (Estetoscópio Littmann Pediátrico, 3M do Brasil, Sumaré, São Paulo, Brazil) positioned between the 3rd and 5th left intercostal space. Respiratory rate (f_R) was measured using a stethoscope positioned on the chest. The observations of beats and breaths were performed during 60 seconds and by the same person in all animals.

The time of anesthesia recovery was observed. The time between the administration of

anesthetic and cat trial to elevate head (Th) and the interval between drug administration and animal's quadrupedal position (Tqp) were recorded.

The first measurement (T0) was taken 90 minutes after each cat's last meal. The second measurement was done immediately before anesthesia (T1) and additional recordings were performed at ten (T2) and thirty (T3) minutes after tiletamine-zolezepam administration.

Parametric data were subjected to one-way analysis of variance (ANOVA) to determine the difference among the different time points of the same group. Two-way ANOVA was used between groups. Bonferroni test was used for post-hoc multiple comparisons at a level of 0.05. Analyses were performed using Prism 5 for Windows (Prism 5, GraphPad Software Inc, California, United States).

RESULTS

In all radiographies of all groups, food was absent in the stomach and intestine (Figure 1). For G and G_{lab} no differences among groups were observed. In G12, the G means at T0 and T1 were lower than values at T2 and T3. In the same group, G_{lab} at T2 was higher than at T1 and T0, which was lower than at T3 (Table 1).

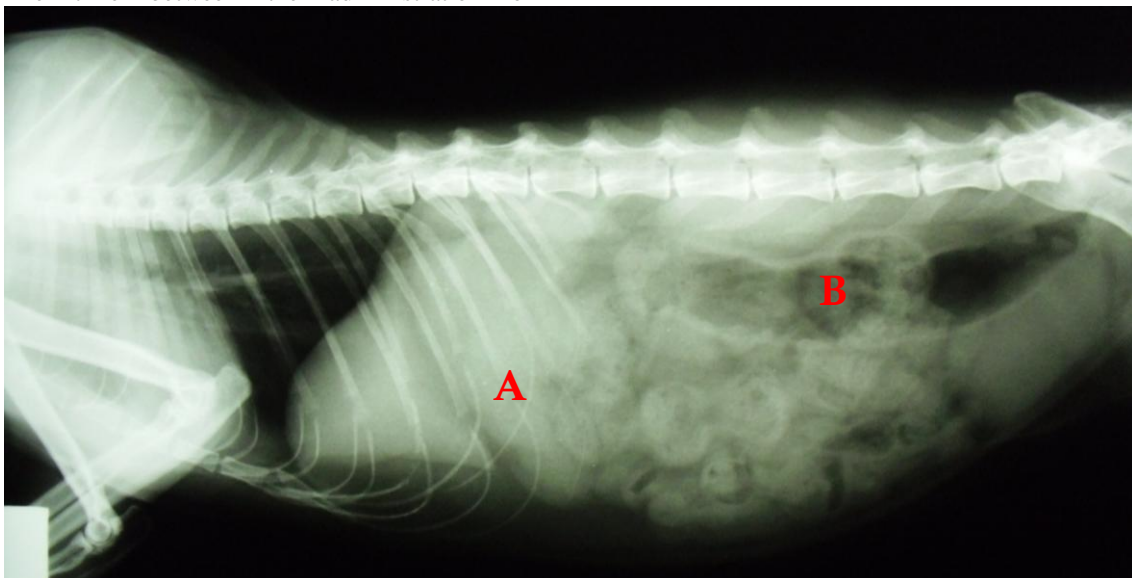


Figure 1. Radiography of a cat submitted to 8 hours of preoperative fasting. Left lateral recumbent projection. (A) Stomach was identified due to the presence of air. There was no enlargement of the stomach. (B) Presence of air in the intestine.

Table 1. Means and standard deviations (Mean±SD) of G, G_{labor}, HR, f_R, T_R, PvO₂, PvCO₂, pH, DB, HCO₃⁻, Hb and Ht in cats submitted to 8 hours (G8), 12 hours (G12) or 18 hours (G18) of preoperative fasting periods and anesthetized with tiletamine-zolazepam (2mg/kg IV)

Parameter	Group	Time			
		T0	T1	T2	T3
G (mg/dL)	G8	66.0±9.0	64.1±7.2	81.6±21.9	88.7±38.4
	G12	72.9±9.6b	70.7±7.9b	100.7±16.7a	92.4±8.2a
	G18	65.3±11.4	67.1±8.0	83.3±12.1	83.6±14.7
G _{lab} (mg/dL)	G8	59.8±13.3	61.2±4.6	76.7±18.8	80.8±36.1
	G12	69.1±18.4b	69.4±10.6bc	91.1±16.1a	83.9±8.5ac
	G18	59.5±16.8	61.8±7.4	76.7±11.2	77.0±13.6
HR (beats/minute)	G8	170±29	189±31	189±45	199±46
	G12	177±16	188±16	182±34	190±32
	G18	169±26	195±15	179±30	190±41
f _R (breaths/minute)	G8	32±9	32±13B	30±17	37±22
	G12	28±6	26±6B	20±4	22±11B
	G18	30±10b	57±22Aa	35±12	52±30A
T _R (°C)	G8	37,7±0,7	37,8±0,1A	38,2±0,8	37,5±0,9
	G12	37,6±0,6a	36,7±0,7Bb	37,5±0,4ac	36,8±0,5b
	G18	37,7±0,4	37,7±0,4A	37,6±0,4	37,4±0,4
PvO ₂ (mm Hg)	G8	44±6b	46±4a	52±6	47±3
	G12	42±6b	47±4a	48±3	46±4
	G18	37±5b	49±8a	48±5a	43±6
PvCO ₂ (mm Hg)	G8	43±3	39±3A	40±5	41±6
	G12	43±3b	32±3Ba	38±1a	38±2a
	G18	39±3	35±4	37±4	40±10
SvO ₂ (%)	G8	66.0±4.6	66.0±7.7	68.0±10.5	65.3±4.9
	G12	62.4±6.8	69.3±10.7	65.7±8.3	65.4±6.3
	G18	58.7±8.1	66.4±11.0	63.2±8.6	61.5±6.8
pH	G8	7.306±0.025	7.284±0.024	7.285±0.015	7.291±0.031
	G12	7.315±0.021b	7.354±0.025a	7.311±0.019b	7.327±0.016
	G18	7.309±0.017	7.307±0.042	7.285±0.027	7.272±0.093
DB (mmol/L)	G8	-4.8±1.4b	-7.8±0.7a	-7.2±1.3a	-7.0±1.2a
	G12	-4.4±1.4b	-7.0±0.6a	-7.0±1.2a	-6.2±0.9
	G18	-6.4±2.1	-8.7±1.0	-8.9±1.6	-8.4±2.9
HCO ₃ ⁻ (mmol/L)	G8	21.2±1.4b	18.2±0.8a	18.7±1.6a	18.9±1.7a
	G12	21.6±1.5Ac	17.5±0.8a	18.6±1.0ac	19.3±0.8c
	G18	19.3±2.2B	16.8±0.9	17.0±1.7	17.7±2.6
Ht (%)	G8	38.3±4.9	41.8±10.1	30.5±6.4	28.3±12.0
	G12	40.0±6.0ab	44.2±6.0a	34.7±3.9bc	28.5±3.3c
	G18	32.0±6.3	36.2±3.5a	27.0±6.3b	26.7±3.6b

Means with different capital letters within each column and with different lower case letters within each row differed significantly. (p<0.05). HR: heart rate, f_R: breath rate, T_R: rectal temperature, PvO₂: venous oxygen partial pressure, PvCO₂: venous carbon dioxide partial pressure, SvO₂: venous hemoglobin saturation, BD: base deficit, HCO₃⁻: bicarbonate concentration, Ht: haematocrit.

For HR, no differences among groups or times were observed. At T1, the f_R values in G8 and G12 were lower than in G18, which was higher than in G12 at T3. In G18, f_R at T0 was lower

than at T1 (Table 1). In G12, at T1, T_R was lower than G8 and G18. Only in G12, from T0 T_R decreased.

Different fasting periods...

In all groups, PvO₂ at T0 was lower than at T1, while in G12 PvCO₂ decreased from T0 (Table 1). At T1, PvCO₂ in G8 was higher than in G12. No differences were registered among groups or among times for SvO₂ and DB. The bicarbonate values decreased from T0 in G8 and G12, but in G18 no differences were observed. For pH, no differences among groups were observed. In G12, pH at T1 was higher than at T0 and T2.

For Ht, in G18, the mean at T1 was higher than at T2 and T3. In G12, it was higher at T1 than at T2 and T3, which was lower than at T0 (Table 1). In G12, the Th mean was higher than G8 (Table 2).

Table 2. Means and standard deviations (Mean±SD) of time between the administration of anesthetic and the cat raising its head (Th) and the interval between drug administration and animal's quadrupedal position (Tqp) in cats submitted to 8 hours (G8), 12 hours (G12) or 18 hours (G18) of preoperative fasting periods and anesthetized with tiletamine-zolazepam (2mg/kg IV)

Group	Th (minutes)	Tqp (minutes)
G8	41±14 ^B	58±17
G12	58±28 ^A	82±18
G18	51±37	67±31

Means with different capital letters within each column differed significantly. (p<0.05).

DISCUSSION

An adequate level of blood glucose is important for cerebral metabolism. Hypoglycemia might occur during general anesthesia but is most common as a nonspecific hormonal response to the stress of anesthesia and operation (Haskins, 2007). However, in anesthetized animals, there may be no outward sign (Pascoe, 2006). According to Kaneko *et al.* (1997), for cats, the normal glucose values are between 73 and 134 mg/dL (4.10 and 7.44 mmol/L). Thus, in this study, at T0 and T1, the glycemia levels were lower than reference values, except for G in G12. This hypoglycemia can be associated with a long preoperative fast (Green *et al.*, 1996) used 157 animals in this study.

A blood glucose concentration below 60 mg/dL (3.33 mmol/L) should be treated with 2.5% to 5.0% glucose infusion, according to Haskins

(2007). However, in this study, during anesthesia the monitoring of glycemia levels was performed with Optium Xceed ® meters that showed glucose values above 60 mg/dL, thus, the treatment was not instituted in these first times.

In dogs submitted to a preoperative fast of 8, 12 or 24 hours and anesthetized with halothane, hypoglycemia was not observed during anesthesia (Guimarães *et al.*, 2007). This difference can be attributed to the species studied, because fasting or food deprivation has not been associated with lipid accumulation in obese human beings or dogs, suggesting a peculiarity of the feline species (De Bruijne, 1979).

From T2, glycemia levels were higher than 73mg/dL (4.10mmol/L) in all groups and in G12, G and G_{lab} increased significantly from T2 (Table 1). The level of glucose increase has been described in dogs anaesthetized with enflurane (Naziroğlu and Gunay, 1999) and in gazelles anaesthetized with tiletamine-zolazepam-xylazine (Yaralioglu-Gurgoze *et al.*, 2005). Acute hyperglycaemia has been reported in cattle given xylazine, reflecting the inhibition of insulin release from the pancreatic β cells by the α 2-adrenergic receptors (Hsu and Hummel, 1981; Lemke, 2007).

Hyperglycemia is characterized by blood glucose concentration >200mg/dL (11.23 mmol/L) and can occur with a typical anesthetic-surgical experience (Haskins, 2007). In this study, hyperglycemia was not observed, but an increase in glycemia levels was registered. If the anesthesia time was longer there might be a hyperglycemia recording. Hyperglycemia is a ubiquitous phenomenon in the perioperative period, linked to the preoperative metabolic state of the patient, neuroendocrine stress response, acute perioperative insulin resistance, as its intraoperative management (Akhtar *et al.*, 2010). However, this event has not been investigated (Haskins, 2007).

For cats, normal HR values are between 120 and 240 beats/minute (Tilley and Burtnick, 1999). Thus, the means observed in this study were within of this interval (Table 1) and no differences were observed among groups and among times. Thus, the preoperative fasting did not influence HR.

In unanesthetized cats f_R is around 22 breaths/minute and when anesthetized it is around 30 breaths/minute (McDonnell and Kerr, 2007). In this study, in G8 and G12 the means were close to these values. However, in G18, f_R increased at T1 and T3. Since different animals were used each groups, we believe that this event can be attributed to stress, because T1 was the measurement immediately before anesthesia, and T3 was thirty 192 minutes after tiletamine-zolezepam administration, the time that cats started to awake. However, the difference among groups was observed at T1 and T3, we did not attribute it to different fasting periods. Guimarães (2006), in halothane-anesthetized dogs submitted to three different fasting periods (12, 18 and 24 hours), did not register f_R differences among groups.

Rectal temperature was stable in G8 and G18 (Table 1), but in G12, at T1 and T3, a T_R decrease was observed. We attributed it to individual differences because Guimarães (2006) did not observe differences among groups for T_R . Besides, we expected an increase of the rectal temperature, because of animal stress due to the procedure.

According to Haskins (2004), a normal PvO_2 value is between 40 and 50mm Hg in healthy dogs breathing room air. The PvO_2 values registered in this study were within this interval (Table 1). Dias *et al.* (2009), in propofol-anesthetized dogs with high intracranial pressure, observed PvO_2 means above 40 mm Hg, and they attributed it to the use of FiO_2 levels of 1.0 and 0.6, differing from this study in that the animals breathed room air.

At T1 PvO_2 increased when compared to T0 in all groups. We attribute this event to the administration of dissociative anesthetic. $P\bar{V}O_2$ increases when cardiac output (CO) increases (Morgan *et al.* 2005), which was not evaluated in this study. However, it is known that dissociative drugs cause myocardial stimulation, which is associated with increased cardiac work and myocardial oxygen consumption. In healthy animals, increases in myocardial oxygen supply usually result from increased CO (Lin, 2007). Thus, we believe that the PvO_2 increase was due to a CO increase.

A normal SvO_2 is reported as 75% (37), with a variation from 60% to 80% (Zaja, 2007). Thus, it can be assumed that both groups had good tissue oxygenation. Additionally, different fasting periods did not change PvO_2 and SvO_2 .

According to King and Hendricks (1997), the $PvCO_2$ is usually 6 to 7mm Hg higher than the $PaCO_2$, whereas Haskins (2004) considers the normal difference to be 3 to 6mm Hg. In G8 and G18, $PvCO_2$ was maintained stable during the entire procedure, but in G12, $PvCO_2$ at T0 was higher than in other times (Table 1). Additionally, at T1, G8 was higher than G12.

Almost 75% of the carbon dioxide produced by tissue metabolism is normally carried to the lungs in the form of bicarbonate (Haskins, 2004). The dissolved carbon dioxide in the blood reacts with water to form carbonic acid. Inside the red blood cells there is a protein enzyme called carbonic anhydrase, which catalyzes the reaction between carbon dioxide and water and accelerates this reaction (Guyton and Hall, 2006). The carbonic acid formed in the red cells (H_2CO_3) dissociates into hydrogen and bicarbonate ions (H^+ and HCO_3^-). Most of the hydrogen ions then combine with the hemoglobin in the red blood cells, because the hemoglobin protein is a powerful acid-base buffer. In turn, many of the bicarbonate ions diffuse from the red cells into the plasma, while chloride ions diffuse into the red cells to take their place (Haskins, 2004; Guyton and Hall, 2006). This is made possible by the presence of a special bicarbonate-chloride carrier protein in the red cell membrane that shuttles these two ions in opposite directions at high speeds (Guyton and Hall, 2006). Thus, the means of bicarbonate registered in this study can be justified by differences observed for $PvCO_2$. In G12, at T0 bicarbonate was higher than in other times. At T1, HCO_3^- mean in G8 was higher than in G12, but without statistical significance (Table 1).

Additionally, in G12, PvO_2 at T0 was lower than in other times, and this event contributed to $PvCO_2$ decrease (T1 to T3), because of the Haldane effect, which results from the simple fact that the combination of oxygen with hemoglobin in the lungs causes the hemoglobin to become a stronger acid. This displaces carbon dioxide from the blood and into the alveoli in two ways: the more highly acidic hemoglobin

Different fasting periods...

has less tendency to combine with carbon dioxide to form carbaminohemoglobin and also causes it to release an excess of hydrogen ions, and these bind with bicarbonate ions to form carbonic acid; which then dissociates into water and carbon dioxide, and the carbon dioxide is released from the blood into the alveoli and, finally, into the air (Guyton and Hall, 2006).

For cats, the normal pH venous value is 7.300 ± 0.087 , for BD it is -5.7 ± 4.6 mmol/L, and for bicarbonate it is 19.4 ± 4.0 mmol/L (Trim, 1994). Thus, means registered in this study were within normal intervals (Table 1). It was known that acute increases in PaCO₂ promote an increase in intracellular CO₂ levels, which shifts the reaction $\text{CO}_2 + \text{H}_2\text{O} \leftrightarrow \text{H}_2\text{CO}_3 \leftrightarrow \text{HCO}_3^- + \text{H}^+$ to the right (Johnson and Morais 2005). However, in this study, the observed PvCO₂ was stable in G8 and G12, while pH and HCO₃⁻ decreased, but without clinical relevance. In G18, PvCO₂ was stable during the entire procedure and it allowed for pH, BD and bicarbonate not to change.

The normal interval for Ht species is 26.1 to 46.7% (Ford and Mazzaferro, 2007), thus the values recorded in this study were within this interval. However, in G12 and G18, Ht decreased at T2 and T3 when compared to T1. This event can be attributed to anesthesia, because these procedures can modulate the red blood cell patrimony and affect intra and postoperative blood loss (Borghetti *et al.*, 2005). Besides, the drugs used in this procedure can change the antioxidant enzyme activities (Godin and Garnett, 1994). In tiletamina-zolazepam – anesthetized sheep (7.5 mg/kg intramuscularly) Ht decreased, and authors concluded that this drug can impair the enzymatic and non-enzymatic antioxidant defense potential in the blood plasma (Ceylan *et al.*, 2007). Thus, the preoperative fasting did not influence Ht.

In G8 Th was lower than in G12, but no differences were observed between these groups for glycemia. This difference can be attributed to individual variability. Therefore, in halothane-anesthetized dogs maintained in different preoperative fast times, the relationship between anesthesia recovery and glycemia level was not observed (Nogueira *et al.*, 2003), corroborating this study.

In conclusion, in tiletamine-zolazepam-anesthetized cats, the different preoperative fasting did not influence glycemia and cardiopulmonary parameters. Additionally, there was no relationship between glycemia and anesthesia recovery.

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Different fasting periods...

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