

USE OF FRUCTOSAMINE IN SMALL ANIMALS WITH DIABETES

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Abstract

Diabetes mellitus in cats and dogs is a complicated illness and its monitorisation is a challenge for the clinician. Thus, fructosamine indicates high level of blood glucose. The increased value of serum fructosamine is found in patients diagnosed with diabetes mellitus and it reflects the degree of glycaemic control, being useful for an objective and proper monitorisation. This parameter is much more accurate than the value of serum glucose level, especially when dealing with cats, due to the fact that in this type of patients the level of blood glucose can be affected by induced acute stress.

This study includes 36 diabetic patients, 19 dogs and 17 cats, from the Department of Internal Medicine of the Faculty of Veterinary Medicine Bucharest, in the past year, for which frutosamine has been determined. This has been conducted in order to asses quick changes in therapy and to improve glycaemic control.

Key words: cat, dog, diabetes, fructosamine.

INTRODUCTION

Fructosamine dosage is a laboratory test used for the diagnosis of diabetes, since the majority of diabetic animals will not always have optimal control of blood glucose. Due to this, fructosamine is being dosed and the results are corroborated with those of the usual laboratory tests, health status and treatment of the diabetic patient.

The study aims to asses the changes necessary to be taken in the treatment of diabetic patients after fructosamine dosage. It is desired that through fructosamine dosage to come to aid in choosing the best possible method of treatment for the small animals presenting different types of diabetes.

MATERIALS AND METHODS

In 2014, we have tested 17 cats and 19 dogs, of different age, sex and breeds.

These pacients came to the Faculty of Veterinary Medicine Bucharest, at the Internal Medicine Clinic due to:

- They presented hyperglycaemia for a long/short period of time;
- They were treated for type II diabetes for a long period of time, and the glycaemic level was in continuous growth;
- They were treated for type I diabetus for a long period of time, and their glycaemia was not responding to the insulin type or the used dosage.

It is necessary to mention that dosing fructosamine can be used for cats, as well for dogs.

Table 1. Fructosamine reference ranges

Fructosamine reference ranges for dogs	
Dogs	Fructosamine values (micromol/l)
Normal non-diabetic dog	225-365
Newly diagnosed diabetic dog	320-850
Treated diabetic dogs:	
Excellent control	350-400
Good control	400-450
Fair control	450-500
Poor control	>500

(Reference: Feldman EC, Nelson RW (2004) Canine diabetes mellitus. In Canine and Feline Endocrinology and Reproduction. 3rd edition. Saunders, St Louis, USA p. 510)

Fructosamine reference ranges for cats	
Cats	Fructosamine values (micromol/l)
Normal non-diabetic cat	190-365
Newly diagnosed diabetic cat	350-730
Treated diabetic cats:	
Excellent control	350-400
Good control	400-450
Fair control	450-500
Poor control	>500

(Reference: Feldman EC, Nelson RW (2004) Feline diabetes mellitus. In Canine and Feline Endocrinology and Reproduction. 3rd edition. Saunders, St Louis, USA p. 563)

RESULTS AND DISCUSSIONS

After a thorough and correct medical history, we have conducted a full clinical examination, after which we proceeded to laboratory tests (biochemical exam, hematologic exam, fructosamine dosage).

Insulin dosage was undergone in cases where patients did not have an insulin treatment initiated.

For every patient, abdominal ultrasound has been recommended, but no pancreatic lesions were noticed.

In patients with hyperglycaemia with values of <180 mg/dL (renal level) and normal fructosamine level, a hygienic-dietary treatment was approached, based on diabetic tea for lowering the glycaemia to normal. Usually, in approximately 30 days, the glycaemia is supposed to reach normal values (maximum 120 mg/dL „a jeun”).

For patients with type II diabetes (<300 mg/dL), treated with oral hypoglycaemants, with high values of fructosamine and low insulin, we have proceeded with a treatment with Mixtard-30, twice a day, or Lantus, once a day (dose 0,5-1 IU/kg/day in dogs and 0,25-0,5 IU/kg/day in cats).

For the cases with slightly risen fructosamine, we only changed the diet and the hypoglycaemants, but in those with normal value insulin the results were satisfactory, as for the cases with low insulin we proceeded to administer insulin due to the fact that the glycaemic level was increasing.

In patients with extremely high values of fructosamine and glycaemia (>300-350 mg/dL) we adjusted the insulin treatment. In the cases where the patients also had other clinical signs (vomiting) and the laboratory exams were not modified, we proceeded to a symptomatic treatment.

The diabetic diet was instituted for every patient included in this study. An increase in physical exercise was recommended, so the patients would achieve an optimal weight, because weight problems (obesity) can lead to insulin resistance.

After the general state stabilisation of the patients and the glycaemia values were on normal values („a jeun”), we have re-dosed the

fructosamine. The results showed that it was in „optimal range” or slightly increased.

Table 2. Results of fructosamine dosage

	µmol/L
Feline patients (17)	215 - 671*
Canine patients (19)	253 – 731*

*range of results of fructosamine dosage in canine and feline patients

CONCLUSIONS

Fructosamine dosage is a laboratory test that can be used to assess canine and feline, of any age, gender or breed, blood glucose levels,

Fructosamine dosage is not conditioned by the stage of the patients diabetes or by the moment when clinical signs have emerged.

It is a method to establish the starting point of the disease, but also to observe the organisms response to the elected method of treatment.

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