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Therapeutic management of diabetes mellitus in a non-descript bitch

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Abstract

An 8 years non-descript bitch was presented with history of polydipsia, polyuria, polyphagia, mild dullness and cloudy eyes. The case was clinically diagnosed as diabetes mellitus; and the treatment was initiated with insulin therapy along with a controlled diet and regular monitoring of blood sugar. Urine glucose level was also monitored and maintained in trace level through urine glucose testing strips at home. The animal was made an uneventful improvement after 7 days of treatment in resolution of their clinical signs except for cloudy eyes.

Keywords: Bitch; diabetes mellitus; insulin therapy; diet; urine test strips

Introduction

Diabetes mellitus is one of the most common endocrinopathies in the dog and cat (Salgado *et al.* 2000) [15] and majority of diabetic dogs appear to have a form of type-1 diabetes analogous to the latent autoimmune diabetes of adult (LADA) in humans (Fleeman and Rand, 2001) [8]. Type-1 diabetes sometimes also referred as insulin dependent diabetes (IDDM) due to complete destruction of beta cells, as the condition requires continuous therapy with insulin from the time of diagnosis. On the other hand if there is a gradual and slow destruction of the beta cells, insulin deficiency may not be absolute initially and such condition is called as non-insulin independent diabetes mellitus (NIDDM). Several etiological factors have been suggested though none have been conclusively proved. It is generally believed to be an immune mediated disease. The other possible causes include genetic predisposition, pancreatitis, obesity, infection, concurrent illness, use of drugs such as glucocorticosteroids and islet amyloidosis (Kashma *et al.* 2007) [11]. Regardless of underlying etiology, diabetic dogs are hyperglycemic and glycosuric, which leads to classical signs of polyuria, polydipsia, polyphagia and weight loss (Rucinsky *et al.* 2010) [14]. The present paper deals with a case of diabetes mellitus in a non-descript bitch and its successful therapeutic management.

History and clinical observations

A non-descript bitch aged about 8 years weighing around 10 Kg was presented to Teaching Veterinary Clinical Complex, BVC, Patna with the history of excessive water consumption, increased appetite, excessive urination, mild dullness and cloudy eyes (cataract) with lacrymation and lack of vision. Based on history and the clinical signs the case was tentatively diagnosed to be of diabetes mellitus and further confirmation was made by hemato-biochemical estimation and urine analysis. Clinical examination revealed a normal pulse (88/min.) and rectal temperature (101.5⁰ F). The hemato-biochemical parameters revealed Hemoglobin (Hb) 13.2 gm%; PCV 41%; TEC 6.08X10⁶/μl, TLC 7.2X10³/μl and Serum creatinine 1.4 mg/dl, BUN 32 mg/dL and serum blood glucose, 522.08 mg/dl respectively. Urine sample was strongly positive for sugar (++++) with trace (+) ketone bodies. Thus, clinical signs, hyperglycemia and glycosuria together documented about confirmation of diabetes mellitus.

Treatment and Discussion

The animal was treated with isophane insulin injection, (Human insultard^a, a monocomponent

human insulin biosynthetic, rDNA origin) @ 0.5 U/Kg BW subcutaneously twice daily with regular monitoring of fasting blood sugar. The dosage was regularized by increasing 0.5 U/dose to get fasting blood sugar of 150-250 mg/ dl and adjusted accordingly to 6 U in the morning and 8 U in the evening with a controlled diet. The animal revealed an uneventful improvement after 7 days of treatment in resolution of their clinical signs including glycosuria that was found to be in trace level, but the cloudiness of eyes were not responded on glycemic control. The owner was advised to continue the same dose of insulin and regular monitoring of glucose in urine with Diastix^b (A single reagent strip).

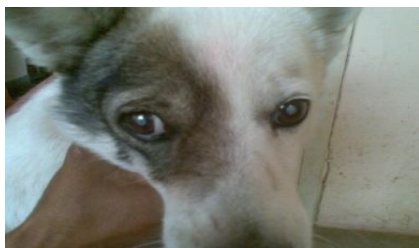
Diabetes mellitus is primarily a disease of middle aged to elderly dogs; and the typical clinical signs as observed in this study and the measurement of both blood and urine glucose levels were in accordance with the findings of Kashma *et al.* 2007^[11] and Rucinsky *et al.* 2010^[14]. Insulin therapy is the most important treatment aspect of diabetes mellitus (Greco *et al.* 1995)^[9] and the present suggested treatment with isophane insulin of rDNA was in accordance with the Dowling, 1995^[6]; Ettinger and Feldman, 2000^[7]; Fleeman and Rand, 2001^[8]; Davison *et al.* 2005^[5], to adequately resolve their clinical signs with better glycemic control.

The goal of treatment for diabetes mellitus is to maintain blood glucose concentration in a mild hyper glycemic state i.e. the blood glucose should stay between 150 and 250 mg/dl for most of the day and should not drop into the low-normal range (Labato and Manning, 1997; Adams, 2001)^[12, 1]. Miller (1995)^[13] suggested that urine glucose and ketones should be negative or trace and must be assessed at home and the diets high in complex carbohydrates with devoid of simple sugars, low in fat and high in fiber are helpful in regulating diabetic dogs (Bruyette, 2001)^[3]. In present case, the cloudiness of eyes were not diminished even after better glycemic control, which was in accordance with the findings of Fleeman and Rand (2001)^[8] who opined that blindness caused by cataract formation eventually occurs in the majority of diabetic dogs and is not dependent on glycemic control and this might be due to secondary to metabolism of excess glucose in lens through sorbitol pathway causing progressive opacity of the lens (Bennett, 2005 and Das, 2013)^[2, 4].

In the present case study, it can be concluded that appropriate monitoring, good glycemic control and feeding can resolve the clinical signs associated with diabetes mellitus.

a. Brand of Abbott India Ltd. Mumbai.

b. Brand of Bayer Polychem (India) Ltd. Mumbai.



Diabetic Cataract in Bitch

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