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Original Research

Prevalence of Diabetes Mellitus in Dogs and Cats at Thonglor International Pet Hospital in Thailand

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Abstract

This study aimed to estimate the prevalence of diabetes mellitus (DM) in Thonglor International Pet Hospital in Thailand, to identify susceptive factors associated with breeds, age, gender, and neuter status related to DM dogs and cats. Cases of DM were identified within the electronic patient records in the IMED system of a total visit (n=25,251), dogs (n1=16,179), cats (n2=9,072) attending in three branches Petchrama, Srinakarin, Tiwanon from January 2022 to December 2022. Eighty-eight cases were identified for DM, including 62 dogs and 26 cats. A prevalence of 0.34 % of DM cases; with 0.38 % of dogs with DM and 0.29 % of cats with DM. DM is not significant in dogs and cats ($p>0.01$). The breed exposed is significant ($p < 0.001$). The high potential for DM in cats is Siamese (0.68%), and domestic Shorthair (0.68%); in dogs are Poodle (1.8 %), Bangkaew (1.65%), and Miniature Schnauzer (1.55%).

Keywords: Breeds, Cats, Diabetes Mellitus, Dogs, Predisposing Factors, Thailand.

Introduction

Diabetes mellitus (DM) is a common endocrine disorder in cats and dogs. From the survey about endocrinopathies, diabetes mellitus is one of the most common endocrine disorders in dogs and cats (Pöppl., 2016b). In DM patients, insulin cannot do its main role - blood glucose homeostasis, this condition results in a high level of blood glucose and leads to severe complicated diseases. Various factors can cause diseases. Predisposing factors such as genetics, age, and status after neutering have been reported to be associated with an increased potential of diabetes mellitus. A subclinical or prediabetic state is a subtle and uncommonly recognized, progressive complication in dogs and cats for a long time without treatment, affecting the animal and the owner's economy. The diagnosis is based on elevated blood glucose levels, requiring multiple blood and urine samples to confirm, especially in cats easy to get stress and induce blood glucose levels. Treatment therapy includes injecting insulin, dietary modification, weight management, and exercise (Bagchi & Nair, 2012; Chandler et al., 2017; Hemmings, 2018; Hoenig, 2002; Sandøe et al., 2014).

Both Vietnam and Thailand are in Southeast Asia and in the group of developing countries, living standards are increasing and the demand for pets is increasing due to increased attention to animal health and welfare. In comparison, in Vietnam, animal demand and welfare have only grown in recent years while Thailand has grown strongly. These pet parents are willing to spend more on high-quality food, clothing, accessories, various pet services, and pet health care (Sutthibongkot, 2019). According to a study of DM in dogs in Dong Thap Province and Vinh Long Province in Vietnam, the prevalence of DM in dogs is 3.76%, but there was no record of a cat with DM in Vietnam (Thảo et al., 2014) However, in Thailand, there was no record of the prevalence of DM in dogs and cats with predisposing factors. For that reason, determining predisposing factors in DM to avoid complicated diseases, and reduce the percentage that happens in dogs and cats is important.

Materials and Methods

Total data visit patients and DM patients of dogs and cats in Thailand came to Thonglor International Pet Hospital in three branches Petchrama, Srinakarin, and Tiwanon from January 2022 to December 2022 with hyperglycemia and glycosuria, complained by the owner with significant signs of polydipsia polyphagia, polyuria, weight loss but still have good appetite. The diagnosis was based on the guideline from WSAVA (Behrend et al., 2018). The patients diagnosed with DM from the visited record will become the data source in this survey. The total number of these cases obtained by signalment was collected from the data center of the IMED system and will be recorded under the patient code. DM dogs and cats were identified by searching the database for records. Breed of DM patients will be accessed individually, some breeds record more prone to DM (Guptill et al., 2003; Hess et al., 2000; Prahl et al., 2007).

Statistical Analysis

Microsoft Excel was used for performing the Chi-Square test, storing, and calculating the collected data.

Results

A total of 25.251 cases including 9,072 cats and 16,179 dogs were visited for diagnosis at Thonglor International Pet Hospital in Thailand (Table 1).

Table 1. The prevalence of DM in dogs and cats in Thonglor International Pet Hospital

	DM	**Other**	**Percentage (%)**
Dog	62	16,117	0.38
Cat	26	9,046	0.29
Total	88	25,251	0.35
** The p-value is 0.21. The result is not significant at p < 0.01.*			

The result shows that 0.35% of DM was recorded in the population. The prevalence of dogs and cats in the survey is nearly the same, and these statements are not meaningful with P > 0.01 showing that DM does not depend on cats or dogs. However, the survey from Australia showed a prevalence of 0.36 % of dogs at risk of DM in this country

(Yoon et al., 2020) and a prevalence of 0.34% of dogs susceptible to DM in the UK (Mattin et al., 2014). Dogs with DM from hospitals in Thailand have nearly the same rate as Australia and the UK. Besides that, the survey at Can Tho University shows that the prevalence of dogs at risk of DM in Vietnam is more than 10 times Thailand, Australia, and the UK (Thảo et al., 2014). In Australia, show is a prevalence of 0.74% of cats susceptible to DM in this country (Lederer et al., 2009) and the prevalence of DM cats in the UK is 0.43% (McCann et al., 2007). DM with cats in our area is lower than twice times in Australia, but nearly the same rate as the UK. There was no record of cats susceptible to DM in Vietnam. The differences in these studies depend on the population, timeline, and geographical location. An incidence rate of 3 cases per 1000 cases in dogs and cats from the Thonglor survey. In Vietnam, the number of dogs with DM is higher than in other countries, maybe because of the diet and lack of care from pet owners which was mentioned by (Thảo et al., 2014).

From the survey breed related to DM in the Thonglor area, there were similarities and differences in the Thailand breed predispositions compared with those reported in Australia, the UK, and Sweden. The prevalence of DM related to breeding in cats was reported in (Table 2). In cats, the Thai/old style known as Siamese has a similar percentage with domestic shorthairs with the highest percentage in the survey and these breeds are higher than Scottish fold, other breeds, and mixed breeds. The prevalence of breed is significantly common in Domestic Shorthair and Siamese with $P < 0.001$. Similar to the survey in Australia, Siamese, and domestic shorthair have been reported in the list of high potential for DM in Australia. However, in the UK and Sweden, Australia has a significant prevalence of Burmese but no record of DM in this breed at Thonglor. Most of the surveys recorded that purebreds have a higher percentage than mixed breeds.

Table 2. The prevalence of DM related to breed in cats

Breeds	DM cats	Population	Percentage (%)
Other breeds	2	3,227	0.06
Domestic Shorthair	2	291	0.68
Mixed	2	942	0.21
Scottish Fold	2	1,744	0.11
Siamese	18	2,868	0.68
Total	26	9,072	0.28
**The p-value is 0.000318. The result is significant at p < 0.001.*			

From (Table 3), all types of Poodle Miniature Schnauzer, and Bangkaew have a ratio more than other breeds 3 times, the result is significant at $p < 0.001$. Poodle and Miniature Schnauzers are recorded in the high susceptive to DM from a survey in Australia (Yoon et al., 2020b). In Thailand, the breed that also has a high potential for DM in dogs is Bangkaew but not being recorded in the West. However, the Australian terrier, Samoyed was recorded as more prone to this disease in Australia, and Swedish was not expressed in the Thonglor area (Fall et al., 2007; Yoon et al., 2020). Yorkshire, which recorded a high potential of DM in the UK has the lowest percentage in this area (Mattin et al., 2014b). The differences in these studies depend on the population, timeline, and geographical location.

Table 3: The prevalence of DM related to breed in dogs

Breed	DM dog	Population	Percentage (%)
Poodle	11	610	1.8
Chihuahua	6	2,017	0.29
Mixed	8	1,499	0.53
Pomeranian	14	3,166	0.44
Pug	2	224	0.89
Bangkaew	3	181	1.65
Beagle	3	390	0.76
Miniature Schnauzer	3	193	1.55
Shih Tzu	3	895	0.33
Siberian Husky	3	578	0.51
Yorkshire	1	585	0.17
Other breeds	5	5,841	0.09
** The p-value categories < 0.00001. The result is significant at p < 0.001.*			

Conclusions and recommendations

In conclusion, DM at risk from data records of visited patients at Thonglor International Pet Hospital is 0.34%. Cats and dogs are not significantly susceptible to DM ($p>0.01$). DM is related to a specific breed ($p < 0.001$). With cats and dog owners, the annual health check is recommended. A health check should be performed once to twice per year, to prevent and detect the disease early. Breeds are susceptible to DM in dogs and cats, the owner needs to take care more and observe the behavior change to prevent long-term DM.

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Contribution by Authors

Equal contribution. All authors declared that 'written informed' consent was obtained from the approved parties for the publication of this article and accompanying images.

Conflict of Interests

There is no conflict of interest.

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