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Prevalence of hypothyroidism in dogs

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Abstract
The present study was conducted on 20,108 dogs aged one year or greater presented for various health reasons from June 2018 to February 2020 to small animal OPD, Teaching Veterinary Clinical Complex, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab with signs of endocrinopathies. On the basis of low levels of T_4 and higher levels of TSH, a total of 35 dogs were diagnosed with hypothyroidism. In the present study the hospital prevalence of hypothyroidism was found to be 0.174 per cent (N=35). The highest prevalence was in Labrador retriever (N=18 dogs, 51.43%) followed by Pug (N=7, 20.0%), Samoyed (N=3 dogs, 8.57%) Dachshund and German shepherd (N=2 dogs, 5.71%) and Pitbull, Shih Tzu and Mongrel (N= 1 each, 2.86%). Results of the study revealed that majority of the cases were from middle age group (21 cases, 60%) followed by young age group (12 cases, 34.3%). The mean total thyroxine level was 0.44 ± 0.61 µg/dl that was significantly ($P \leq 0.01$) low compared to mean concentration of healthy dogs (2.17±0.26 µg/dl). The mean thyroid stimulating hormone (TSH) levels was 6.79± 0.01 ng/ml in hypothyroid dogs, that was significantly ($P \leq 0.01$) high as compared to mean concentration of healthy dogs (0.95±0.04ng/ ml). In the present study, significantiy low ($P \leq 0.01$) levels of serum total thyroxine and elevated levels of thyrotropin were recorded in hypothyroid dogs.

Keywords: Dog, Hypothyroidism, T_4, TSH, Prevalence

Introduction

Clinical Examination

The complete health record of suspected dogs including owner details including age, breed, sex, body weight, type of diet given, nature of illness, dermatological abnormality (if any), any previous treatment given including the prescription given were recorded. Sampling was not discriminated on the basis of breed or sex. The dogs which were selected on the basis of dermatological disorders had any one or more of the following signs or lesions on their body parts *viz*. bilateral symmetrical alopecia at neck, lateral abdomen, ventral thorax, alopecia of tail (rat-tailed appearance); hyperpigmentation; pruritus; pyoderma; seborrhoea; erythema; thinning of hair, alopecic lesions on face, back, abdomen, pinnae, legs, feet etc. Some of the dogs with a clinical picture of hair loss and had not responded to previous treatment with ectoparasiticides, miticides, antifungal or herbal preparations were also included in the study. Metabolic abnormalities recorded were lethargy, weight gain, exercise intolerance and cold intolerance. Some of the dogs with dermatological problems were additionally having other clinical signs like metabolic disorders, reproductive disorders etc. that were suggestive of hypothyroidism.

Statistical analysis

The mean values were compared between hypothyroid and control groups using independent samples t-test. Data was subjected to statistical methods using SPSS software 16th version. A two tailed P-value less than 0.05 was considered as statistically significant.

Results and Discussion

On the basis of low levels of T4 and higher levels of TSH, a total of 35 dogs were diagnosed with hypothyroidism. In the present study the hospital prevalence of hypothyroidism was found to be 0.174 per cent (N=35). However, comparatively higher prevalence of hypothyroidism was recorded in previous studies ranging from 0.2 to 0.8 per cent (Panciera 1994 and Dixon *et al.* 1999) [15, 5]. In contrast Gulzar *et al.* (2014) [8] reported that the prevalence of hypothyroid was found to be 0.4 per cent. The paucity of accurate data due to challenges in diagnosis was identified as the major cause of variable prevalence of this endocrine disorder in different breeds (Graham *et al.* 2007) [7].

The mean thyroxine (T4) and TSH values are presented in Table 1. In the hypothyroid dogs, the mean total thyroxine level was 0.44 ± 0.61 µg/dl that was significantly (P≤ 0.01) low compared to mean concentration of healthy dogs (2.17±0.26 µg/dl). The mean thyroid stimulating hormone (TSH) levels was 6.79± 0.01 ng/ml in hypothyroid dogs, that was significantly (P≤0.01) high as compared to mean concentration of healthy dogs (0.95±0.04ng/ ml).

Table 1: Status of thyroid hormones in hypothyroid dogs (Mean±S.E)

Clinical markers	Parameters	Healthy dogs	Hypothyroid dogs	P value
Hormones	T4 (ug/dl)	2.17±0.26 (1.21-3.65)	0.44±0.61 ** (0.19-1.01)	0.00
	TSH (ng/ml)	0.95±0.04 (0.09-1.08)	6.79±0.01** (2.67-10.54)	0.00

Figures in parentheses indicate range,
Superscripts with **Significant at 1% level (*P*<0.01)
Superscripts with *Significant at 5% level (*P*<0.05)

In the present study, significantiy low (P≤ 0.01) levels of serum total thyroxine and elevated levels of thyrotropin were recorded in hypothyroid dogs. These findings were in agreement with Mooney (2003) [14] and Jagpreet *et al.* (2006) [9] who stated that the diagnosis of hypothyroidism was achieved by demonstration of low TT4 and elevated TSH concentrations. The present study corroborated with Dixon *et al.* (1999) [5] who found that 70 per cent of hypothyroid dogs had low TT4 (less than 15nmol/l).

The decrease in T_4 values encountered in hypothyroid cases is in agreement with the findings of Bansal *et al.* (2007) [2] and Abiramy *et al.* (2009) [1]. Chakraborty (2007) [4] opined the estimation of T4 as a specific diagnostic tool for identifying hypothyroidism in dogs. Similarly Kwatra *et al.* (2007) [12] also reported significantly lower mean levels of T3 and T4 hormones in mange cases as compared to the control group. In contrast, Suraniti *et al.* (2008) [18] reported that in Doberman pinscher dogs between 6-8 years suffering with hypothyroidism there was normal range of T4 with highly elevated TSH. In the present study, low levels of TT4 with an elevated level of TSH was recorded. Measurement of canine-thyrotropin had an excellent specificity and suggested that the measurement of TSH could be a valuable tool in confirming canine hypothyroidism (Boreti and Reusch 2004) [3].

Occurrence of hypothyroidism

Breed wise prevalence

The breed wise prevalence of hypothyroidism in the dogs is presented in Table 2. The highest prevalence was in Labrador retriever (N=18 dogs, 51.43%) followed by Pug (N=7, 20.0%), Samoyed (N=3 dogs, 8.57%) Dachshund and German shepherd (N=2 dogs, 5.71%) and Pitbull, Shih Tzu and Mongrel (N= 1 each, 2.86%). The observations recorded in the present study were in accordance with Kumar *et al.* (2014) [10] who reported that maximum number of cases were observed in Labrador breed, followed by German Shepherd dogs and Spitz dog and Milne and Hayes (1981) [13] who stated that nine breeds were found to be at high-risk for hypothyroidism namely Golden retrievers, Doberman pinschers, Dachshunds, Shetland sheepdogs, Irish setters, Pomeranians, Miniature schnauzers, Cocker spaniels and Airedales. Two breeds with a significant risk of deficit were German shepherds and mixed breed (mongrel) dogs. Panciera (1994) [15] documented that a variety of dog breeds were at high risk tor hypothyroidism such as German shepherd, Doberman pinscher, Grey hound, Daschund and Boxer.

The disease also occurred in mixed breed dogs. The findings of the present study were in partially agreement with Panciera (1994) [15] as the prevalence of hypothyroidism was recorded maximum in German shepherd followed by Spitz, Labrador retriever, Golden retriever, Doberman pinscher and Daschund. Kumar *et al.* (2007) [11] reported that Spitz followed by Labrador and German shepherd were at higher risk for hypothyroidism.

Table 2: Distribution of hypothyroid cases on the basis of breed of dogs (N=35)

Dog Breed	Number of Cases	Percentage (%)
Labrador	18	51.43
Pug	7	20.00
Dachshund	2	5.71
Samoyed	3	8.57
German Shepherd	2	5.71
Mongrel	1	02.86
Shih Tzu	1	2.86
Pitbull	1	2.86
Total	35	100

Age wise prevalence

Observations of the clinical cases in relation to different age groups are presented in Table 3. As the dogs were categorised into three age group, young age group (less than 5yrs), middle age group (5≤10 years) and 10 years and above. Results of the study revealed that majority of the cases were from middle age group (21 cases, 60%) followed by young age group (12 cases, 34.3%) and lowest percentage was found in old age group (2 cases, 5.7%). The results of the present study were similar to Kumar *et al.* (2007) [11], who reported that the highest prevalence (61.70%) was recorded in dogs between 5-10 years of age followed by 17.03 per cent in 10-14 years old dogs, 14.89 per cent and 6.83 per cent in dogs aged more than 14 years and less than 5 years, respectively. These observations were in accordance with the studies of Ettinger and Feldman (2000) [6] who reported that the mean age at diagnosis of hypothyroidism was seven year, with a range of 0.5 -15 years. In contrast, Milne and Hayes (1981) [13] stated that risk of hypothyroidism was greatest among younger dogs, further suggesting a genetic component to the etiology of hypothyroidism. The present findings were in agreement with Panciera (1997) [16] who documented that the mean age at diagnosis of hypothyroidism is 7 years, with a range of 0.5 to 15 years. Kumar *et al.* (2007) [11] stated that hypothyroidism commonly affected dogs between 4 to 15 years of age.

Table 3: Distribution of hypothyroid cases on the basis of age of dogs (N=35)

Age (years)	Number of Cases	Percentage
Young age group (less than 5 years of age)	12	34.30
Middle age group (5 ≤ 10 years)	21	60.00
Old age group (more than 10 years)	2	5.70
Total	35	100

Gender wise prevalence

Observations of the clinical cases in relation to gender are presented in Table 4. In the present study, out of 35 cases, 26 cases were recorded in males (74.29%) and 9 cases were recorded in females (25.71%). Among 26 males, 10 (38.46%) were neutered and 16 (61.54%) were intact whereas in females, 3 (33.33%) were spayed and 6 (66.67%) were intact. In this study, two third of the dogs suffering from hypothyroidism were intact. On the other hand, Milne and Hayes (1981) [13] reported in their study that spayed female dogs displayed a significantly higher risk of hypothyroidism when compared to intact females. Whereas, statistically non significant difference was recorded in male castrated dogs to their intact counterparts. Kumar *et al.* (2007) [11] also reported that spayed females and castrated male dogs were at higher risk for primary hypothyroidism. These variations in the studies might be due to lesser number of animals presented with hypothyroidism.

Table 4: Gender and Neuter status of hypothyroid dogs

Gender	Number of cases	Intact	Neuter
Male	26 (74.29%)	16 (61.54%)	10 (38.46%)
Female	9 (25.71%)	6 (66.67%)	3 (33.33%)

Figures in parentheses indicate percentage

Conclusion

In the present study it was concluded that prevalence of hypothyroidsm was 0.174. Hypothyroidism was prevalent in Labrador retriever dogs affecting middle aged and male dogs.

References

1. Abiramy A, Selvi D, Rao VN, Lakkawar AK. In: Proceedings of the International summit on Advancing Veterinary Medical Care: Challenges and Strategies. 27th Indian Society for Veterinary Medicine (ISVM) Convention Satellite Seminar on Veterinary Internal Medicine 2009, 95.
2. Bansal BK, Chohan AS, Singh RS, Dhaliwal PS. Hypothyroidism in a bitch. Indian Veterinary Journal 2007;84:512-513.
3. Boretti FS, Reusch CE. Diagnostic specificity of canine thyrotropin in the diagnosis of hypothyroidism in dogs. European Journal of Campanion Animal Practice 2004;16(2):135 189.
4. Chakraborty A. Text book of Clinical Veterinary Medicine. Kalyani Publications, Calcutta., 4th ed 2007, 646-649.
5. Dixon M, Reid SWJ, Mooney CT. Epidemiological, clinical, haematological and biochemical characteristics of canine hypothyroidism. Veterinary Record 1999;145(17):481-487.
6. Ettinger SJ, Feldman EC. Textbook of Veterinary Internal Medicine, Diseases of the Dog and Cat, 5th ed. Philadelphia, WB Saunders 2000, 1420-1427.
7. Graham PA, Refsal KR, Nachreiner RF. Etiopathologic findings of canine hypothyroidism. Veterinary Clinic of North American Small Animal Practice 2007;37(4):617-31.
8. Gulzar S, Khurana R, Agnihotri D, Aggarwal A, Narang G. Prevalence of hypothyroidism in dogs in Haryana. Indian Journal of Veterinary Research 2014;23:1-9.
9. Jagpreet K, Randhwa SS, Neetu S. Effect of age, sex and breed on plasma concentrations of thyroid hormones in dogs. Indian Journal of Veterinary Medicine 2006;26(1):1-3.
10. Kumar P, Kumari RR, Kumar M, Kumar S, Chakrabarti A. Current practices and research updates on diabetes mellitus in canine. Veterinary World 2014;7(11):952-59.
11. Kumar KS, Rao DST, Sharma G. A Clinical Study on Hypothyroidism in Dogs. Intas Polivet 2007;8:460-464.
12. Kwatra J, Randhawa SS, Saini N, Dhaliwal PS. Thyroid function in dogs suffering from mange infestations. Indian Journal of Veteerinary Medicine 2007;27:68-69.
13. Milne KL, Hayes HMJr. Epidemiologic features of canine hypothyroidism. The Cornell Veterinarian 1981;71(1):3-14.
14. Mooney CT. Clinical endocrinology for the practising veterinary surgeon. 4: canine hypothyroidism Irish Veterinary Journal 2003;56(5):263-270.
15. Panciera DL. Hypothyroidism in dog; 66 cases (1987-1992). Journal of American Veterinary Medical Association 1994;204:761-767.
16. Panciera DL. Clinical manifestations of canine hypothyroidism. Veterinary Medicine 1997;92:44-49.
17. Scott-Moncrieff CR, Guptill-Yoran L. Hypothyroidism. In: Ettinger, E.J. and E.C. Feldman (ed.) Textbook of Veterinary Internal Medicine 5th ed, WB Saunders, Philadelphia 2000, 1419-1429.
18. Suraniti AP, Gilardoni LN, Rallmala MG, Ehevarria M, Marcondes M. Hypothyroid associated polyneuropathy in dogs: Report of six cases. Brazillian Journal of Veterinary Research and Animal Sciences 2008;45(4):284-288.
19. Utsugi S, Saito M, Shelton GD. Resolution of polyneuropathy in a hypothyroid dog following thyroid supplementation. Journal of American Animal Hospital Association 2014;50(5):345-9.