Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

E-ISSN: 2320-7078
P-ISSN: 2349-6800
www.entomoljournal.com
JEZS 2021; 9(5): 214-218

Received: 07-07-2021
Accepted: 09-08-2021

Arpana Barua
Research Scholar, Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Dhritismita Boruah
Research Scholar, Department of Veterinary Epidemiology and Preventive Medicine, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Arabinda Phukan
Professor, Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Bhaben Chandra Baishya
Assistant Professor, Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Jyoti B Dutta
Professor and Head, Department of Veterinary Epidemiology and Preventive Medicine, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Ditul Barman
Assistant Professor, Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

Corresponding Author:
Arpana Barua
Research Scholar, Department of Veterinary Clinical Medicine, Ethics and Jurisprudence, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam, India

A study on prevalence of otitis in dog in Guwahati, Assam

Arpana Barua, Dhritismita Boruah, Arabinda Phukan, Bhaben Chandra Baishya, Jyoti B Dutta and Ditul Barman

Abstract
The present study with the objective to study the prevalence and occurrence of otitis in dogs in Guwahati, was undertaken w.e.f. 1st August'2019 to 31st July'2020. The overall prevalence of otitis in dog was 2.11%, where higher occurrence was in Labrador breed (16.07%) and simultaneously males (56.25%) being predominantly affected within the age group above 4- 6 years (30.36%). Clinical signs associated with otitis were ear puritus, restlessness, head shaking, pawing at the ear, tilting of affected ear, circling, purulent discharge, pain on palpation, swelling, foul smell, hyperaemia, and hyperpigmentation.

Keywords: otitis, prevalence, occurrence, puritus, hyperaemia

Introduction
Dog has been the most loving and faithful companion of human beings since ages. They also provide emotional support, reduce stress levels and increase the social activities of the owner. The close association makes human beings notice and attend many disease conditions to permit his pet's healthy life. Otitis externa means the inflammation of ear. The structure of external ear canal is similar to the skin. Therefore, the diseases that affect the skin can also involve the external ear canal. Otitis condition has a multifactorial etiology and microbial infection is the predominant cause, which can be manifested by exudates, erythema, oedema, offensive odour and pruritus as described by Karlapudi (2017) [9]. Clinical symptoms include – unbearable pain, swelling inside the ear canal, hyperaemia, foul smell, restlessness, shaking of head, pawing of the affected ear and circling movement. Otitis is a condition of the ear which may not become apparently observed until considerable changes take place in the auditory canal or inner part of the ear (Kale and Aher, 2004) [7].

Materials and Methods
The present study was conducted in Veterinary Clinical Complex (VCC), College of Veterinary Science (C.V.Sc), Assam Agricultural University (AAU), Khanapara. Dogs registered at VCC, C.V.Sc, AAU, Khanapara from different parts of Guwahati during the period from 1st August, 2019 to 31st July 2020 were considered for the present study. Dogs with clinical signs suggestive of otitis were screened on the basis of clinical signs *viz.* shaking of head, pawing at the ear, foul smell from the ear, lesions on the external ear and subjected to detailed physical examination and otoscopic examination.

Parameters Under Study
Prevalence and occurrence of otitis was studied in all the dogs suspected to be suffering from otitis. Prevalence was analyzed from the total number of cases registered at VCC, C.V.Sc, AAU, Khanapara. Occurrence was calculated from the total number of positive cases. Further, prevalence and occurrence were analyzed according to – a) age, b) breed, c) sex and d) season

Statistical Analysis
The statistical analysis of the data was carried out according to the standard statistical procedure using SPSS version 20.0 and SAS 9.0.

Results and Discussion

Prevalence of otitis in dog

In the present study, total 5312 dogs were registered at VCC, out of which 572 suspected dogs were screened out and 112 dogs found positive for otitis. The prevalence of otitis was recorded 2.11%. However different workers had recorded variable prevalence of otitis in dogs from different geographical areas, which were higher than the present record. Roy *et al.* (2018) [21] recorded 18.14% and Neill *et al.* (2014) [18] recorded 10.20%. Higher prevalence of otitis than the present finding might be due to different geo-climatic condition and managerial practice.

North-Eastern region is a relatively humid area favoring the growth of micro-organisms. Excess cerumen formation in the ear canal might be another contributing factor for the growth of microorganisms. History on the management of dogs revealed that regular cleaning practices after the bath were not followed in most of the cases resulting in accumulation of the water inside the ear canal, which lead to excess moisture trapped inside the ear canal and thus predisposes to otitis.

Breed-wise

The prevalence of otitis was described in the table 1. The highest prevalence was recorded in Pomeranian (9.52%) and lowest in German Shepherd (0.95%). The present findings contradict with the observations of several other workers. Swiecicka *et al.* (2015) [22] reported highest prevalence in Labrador Retriever (20.2%) and lowest in German Shepherd (6.6%). Baxter (2011) [1] reported highest prevalence in Cocker Spaniel (19%).

The breed wise occurrence of otitis in dogs was found to be highest in Labrador (16.07%) and lowest in Boxer (1.79%). In the result, the chi square was found to be 58.08 and $p < 0.01$, which showed significant association between breeds and occurrence of disease, indicating that the breed of the animal has a positive correlation between the occurrences of the infection in dog. The higher occurrence rate of otitis in Labrador breeds might be due to involvement of various factors such as humidity, age, pendulous ears, season, inter-current diseases as described by Kumar *et al*., (2003) [13]. Kumar *et al*. (2014) [15] explained that Labradors have more apocrine tubular glands than other breeds, which might predispose them to otitis. Pendulous structure of ear of dogs facilitates improper ventilation to the ear canal and leads to increase accumulation of moisture in the canal, which might be a contribuiting factor for otitis (Kiss *et al.*, 1997) [11]. Lowest occurrence of otitis in Boxer as recorded in the present study might be because of less number of dogs presented at VCC.

Table 1: Breed-Wise Prevalence Of Otitis In Dog

Breeds	Total no. of dog presented	Total no. of suspected cases	No. of positive cases	Prevalence (%)	Occurrence (%)	Chi-square value	p-value
Labrador	1042	132	18	1.73	16.07	58.08^{**}	3.13×10^{-9}
Cocker Spaniel	256	39	15	5.86	13.39		
Lhasa Apso	210	40	13	6.19	11.61		
Beagle	195	38	11	5.64	9.82		
Cross bred	475	52	10	2.11	8.04		
Pug	282	26	9	3.19	8.93		
Mongrel	621	87	8	1.29	7.14		
German Shepherd	840	82	8	0.95	7.14		
Golden Retriever	701	57	8	1.14	7.14		
German spitz	626	11	6	0.96	5.36		
Pomeranian	42	5	4	9.52	3.57		
Boxer	22	3	2	9.09	1.79		
Total	5312	572	112	2.11	100		

$p < 0.01$: highly significant, $p < 0.05$: significant, $p > 0.05$: non-significant

Sex-wise

In the present study, there is no significant difference recorded in male and female dog but the mean value of male (2.23%) was higher than the female (1.96%) as shown in table 2. This finding was similar with the observations of Kamaljyoti *et al*. (2017) [8] and Bernardo *et al*. (1998) [2]. This might be due to the higher number of male dogs presented to the clinics as compared to females. Occurrence of otitis in Mongrel dogs could be due to the roaming habits of male dogs during breeding season, where they come in close contact with other dogs. Even though males appeared to be more prone to otitis, no possible evidence was documented about the role of male sex hormone i.e. testosterone to enhance the susceptibility to the causative micro-organism as documented by Kumar *et al*. (2014) [15]. They also opined that, increase sebum production might be due to androgen hormones, which predisposed to flare up the infection, whereas estrogens elicit an opposite response. However, Topala *et al*. (2007) [23] and Devaya (1993) [4] revealed that there was no significant difference between sex predispositions to otitis in dogs.

However, on occurrence basis the highest was in male dogs (56.25%) and lowest was in female dogs (43.75%). On the contrary, Fernandez *et al*. (2006) [6] reported higher occurrence of otitis in female than that of male dogs.

Season-Wise prevalence of otitis in dog

The present study showed that season wise prevalence (table 2) of otitis was highest in monsoon season (3.77%) and lowest in pre-monsoon season (0.74%). The results were similar with Kamaljyoti *et al.* (2017) [8]; Kumar *et al.* (2002); Baxter (2011) [1]; Chaudhury and Mirakhur (2002) [3] and Kim *et al.* (1999) [10] who reported higher prevalence during monsoon season (June, July, August and September).

Occurrence was highest in monsoon season (41.96%) followed by post-monsoon season (28.57%), winter (16.96%) and pre-monsoon (12.50%). In the result, the chi square was found to be 22.82 and $p < 0.01$, which exhibited significant association between season and occurrence of disease indicating that the season has a positive correlation between the incidence of the infection in dog. The occurrence was more in those months could be attributed due to relatively

high rainfall, atmospheric temperature and humidity which might favors the growth of bacteria as well as fungi. Chauddhury and Mirakhur (2002) [3] stated that increased humidity play an important role in the occurrence of otitis externa.

Table 2: Sex-Wise And Season-Wise Occurrence Of Otitis In Dog

Sex	Parameters	Total no. of dog presented	Total no. of suspected cases	Positive	Prevalence (%)	Occurrence (%)	Chi-square value	p-value
Sex	Male	2818	365	63	2.23	56.25	3.45^{NS}	0.06
	Female	2494	207	49	1.96	43.75		
Season	Pre-monsoon	1852	152	14	0.74	12.50	22.82^{**}	4.41×10^{-5}
	Monsoon	1248	156	47	3.77	41.96		
	Post-monsoon	1254	146	32	2.55	28.57		
	Winter	958	118	19	1.98	16.96		

p <0.01 : highly significant, p <0.05 : significant, p >0.05 : non-significant

*Pre-monsoon (March, April and May); Monsoon (June, July, August and September); Post-monsoon (October and November) and Winter season (December, January and February)

Age-wise prevalence in otitis

In the present study out of 112 otitis cases, 12 cases (up to 2 years), 19 cases (above 2-4 years), 34 cases (above 4-6 years), 22 cases (above 6-8 years), 18 cases (above 8-10 years) and 7 cases (above 10 years) irrespective of sex and breed were found positive for otitis (Table 3). In the result highest prevalence of canine otitis was recorded in the age group above 8-10 years (4.00%) and lowest in the age group up to 2 years (0.78%). The present findings were in accordance with Kumar (2001) and Fernandez *et al*. (2006) [6].

Age-wise occurrence percentage of otitis revealed highest in above 4 to 6 years (30.36%) and lowest in above 10 years (6.25%) respectively. The chi square value was found to be 19.48 and p-value was found to be 0.0015 (p <0.01), which showed significant association between age groups and occurrence of disease indicating that the age of the animal has a positive correlation between the incidence of the infection in dog. The occurrence of otitis in between age group above 4 to 6 years was high probably due to the fact that physiologically wax secretion is more in these age groups of dogs. These groups of dogs were more energetic and usually get more exposure to external environment as well as the etiological agents which might be a contributing factor for otitis.

Table 3: Age-Wise Prevalence of Otitis In Dog

Age	Total no. of dog presented	Total no. of suspected cases	No. of positive cases	Prevalence (%)	Occurrence (%)	Chi-square value	p-value
Up to 2years	1533	121	12	0.78	10.71	19.48^{**}	0.0015
> 2-4 years	895	92	19	2.12	16.96		
> 4-6 years	1089	104	34	3.12	30.36		
> 6-8 years	680	109	22	3.24	19.64		
> 8-10 years	450	98	18	4.00	16.07		
>10 years	665	48	7	1.05	6.25		
Total	5312	572	112	2.11	100		

p <0.01 : highly significant, p <0.05 : significant, p >0.05 : non-significant

Occurrence of otitis based on ear conformation

The prevalence of otitis based on conformation of ear was as shown in Table 4. Present study revealed that pendulous eared dogs (65.19%) were affected more than the erect eared dogs (34.81%). Statistically the chi square test was found to be 10.32 and p-value was found to be 0.0013 (p <0.01), which showed significant association between ear conformation and occurrence of disease indicating that the ear conformation of animal has a positive correlation between the incidence of the infection in dog.

These results were similar with Topala *et al.* (2007) [23] and Bernardo *et al.* (1998) [2]. Dogs having pendulous ear are more prone for otitis, since it might affect the air flow, heat radiation and convection from the ear canal which might favors the growth of microorganism, if compared to erect eared dogs. However, according to Ehinger (1976) [5] insufficient ventilation, absorption and evaporation of moisture may lead to maceration of the ear canal epithelium and subsequently may predispose to otitis in dogs having pendulous / drooling ears. On contrary to the present result Devaya (1993) [4] reported higher incidence of otitis in dog with erect ear.

Table 4: Occurrence of Otitis Based on Ear Conformation

Ear conformation	No. of positive cases	Percentage (%)	Chi-square value	p-value
Pendulous ear	73	65.19	10.32^{**}	0.0013
Erect ear	39	34.81		
Total	112	100		

p <0.01 : highly significant, p <0.05 : significant, p >0.05 : non-significant

Observed clinical signs associated with otitis

Clinical signs observed in the present study were presented in the Table 5. Clinical signs of otitis observed in the present study were hyperaemia (100%), pawing at the ear (100%), ear puritus (98.21%), pain on palpation (97.32%), swelling (92.86%), foul smell (69.64%), purulent discharge (64.29%), head shaking (42.86%), restlessness (31.25%), circling (31.25%), tilting of affected ear (26.79%), and hyper

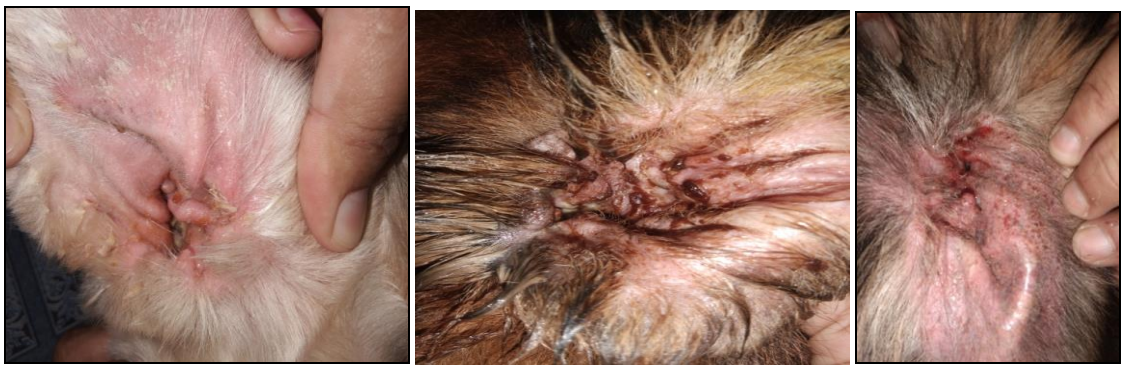
pigmentation (16.07%). The Chi-square value was 209.42 and p <0.01, revealed that signs of otitis in dog were significant. These findings were also observed by Fernandez *et al.* (2006) [6] d bc; Kale and Aher (2004) [7] and Kumar (2001) [14].

In the present study development of pruritus could be attributed to the local bacterial proliferation on the skin with subsequent release of bacterial toxins and enzymes resulting in inflammation and pruritus depicted by Leib and Monoroe (1997) [16] and Marak (2019) [17]. They also expressed that signs like erythema, pain, hyperpigmentation, purulent secretion, excessive wax secretion might be due to the release of chemical mediators such as serotonin, prostaglandins, peptides and leukotrienes at the site of inflammation.

Table 5: Observed Clinical Signs Associated With Otitis In Dog

Clinical signs	Total no. of cases	Percentage (%)	Chi-square value	p-value
Ear pruritus	110	98.21	209.42^{**}	3.68×10^{-38}
Restlessness	35	31.25		
Head shaking	48	42.86		
Pawing at the ear	112	100.00		
Tilting of affected ear	30	26.79		
Circling	35	31.25		
Purulent discharge	72	64.29		
Pain	109	97.32		
Swelling	104	92.86		
Foul smell	78	69.64		
Hyperaemia	112	100.00		
Hyperpigmentation	18	16.07		

p <0.01 : highly significant, p <0.05 : significant, p >0.05 : non-significant



A. B. C.

Fig 1: Pictures Showing (A) Erythema of The Affected Ear and Presence of Pus, (B) Excessive Secretion of Wax from The Ear, (C) Bleeding from The Affected Ear

References

1. Baxter M. The incidence and microbiology of otitis externa of dogs and cats in New Zealand. New Zealand Veterinary Journal. 2011;20(3):29-32.
2. Bernardo MF, Martins MH, Martins LM. A survey of mycotic otitis externa of dogs in Lisbon. Revista Iberoamericana de Micologia 1998;15:163-165.
3. Chaudhary M, Mirakhur KK. Studies on occurrence of canine otitis : Veterinary Clinics of North America. Small Animal Practice 2002;79:748-749
4. Devaya KA. Clinico – epidemiology bacteriological and therapeutic studies on the ear infection in dogs. M.V.Sc thesis submitted to the University of Agriculture Sciences, Hebbal, Bangalore 1993.
5. Ehinger T. Experiences in the therapy of the skin diseases in small animal practice with preparation of sofan pfizer. Kleintierpraxis 1976;21:285-287
6. Fernandez G, Glen B, Amri V, Omaira P, Ramire GFRA. Isolation and identification of microorganisms present in 53 dogs suffering otitis externa. Revista Cientifica 2006;16(1):23-30
7. Kale SD, Aher VD. Studies on the symptomology and diagnosis of otitis in clinical cases of canine. Intas polivet 2004;5(1):103-107.
8. Kamaljyoti, Sharma KA, Filia G, Sharma S. Studies on *Malassezia* infection in otitis externa of dogs. Indian Journal of Animal Research 2017;7(1):197-200
9. Karlapudi KS. Diagnosis and management of *Malassezia* otitis in dogs. Journal of Pharmaceutical Innovation. 2017;6(9):36-38.
10. Kim KH, Choi WP. Microflora of the ear canal in healthy and dogs with otitis externa. Korean Journal of Veterinary Research. 1999;39(3):566-574.
11. Kiss G, Radvanyi S, Szigeti G. New combination for the therapy of canine otitis externa. Journal of Small Animal Practice 1997;38(2):51-60.
12. Kumar A, Singh K, Sharma A. Prevalence of *Malassezia pachydermatis* and other organisms in healthy and infected dogs ears. Israel Journal of Veterinary Medicine. 2002;57(4).
13. Kumar A, Singh K, Sharma A. Treatment of otitis externa in dogs associated with *Malassezia pachydermatitis*. Indian Veterinary Journal. 2003;79(7):727-729.
14. Kumar A. Studies on the prevalence, Characterization and therapy of *Malassezia pachydermatitis* associated with otits externa and dermatitis in dogs. Indian Veterinary Journal 2001;194:169-170.
15. Kumar S, Hussain K, Sharma R, Chhibber S, Sharma N. Prevalence of canine otitis externa in Jammu. Indian

Journal of Animal Research 2014;4(1):121-129.
16. Leib ME, Monoroe WE. Diseases of the integument. Textbook of Practical Small Animal Internal Medicine. 1997, 3-116.ISBN:0721648398
17. Marak SS. Canine pyoderma : diagnosis and therapeutic management. M.V.Sc Thesis, A.A.U. Guwahati, Assam 2019.
18. Neill OGD, Church DB, McGreevy PD, Thomson PC, Brodbelt DC. Prevalence of Disorders Recorded in Dogs Attending Primary-Care Veterinary Practices in England. PLOS ONE 2014;9(3):e90501.
19. Oliveira CL, Carlos ALL, Raimunda Sâmia NB, Cibele Barreto MC. Etiology of canine otitis media and antimicrobial susceptibility of coagulase-positive *Staphylococci* in Fortaleza City, Brazil. Brazilian Journal of Microbiology 2006;37:144-147 ISSN 1517-838.
20. Pye C. Pseudomonas otitis externa in dogs. Veterinary Dermatology 2018;59:1231-1234.
21. Roy M, Kashyap R, Roy S. Prevalence of canine otitis externa, etiology and clinical practice in and around Durg District of Chhattisgarh state, India. International Journal of Current Microbiology and Applied Sciences. 2018;7(3) ISSN: 2319-7706
22. Swiecicka N, Bernacka H, Fac E, Zawislak J. Prevalence and commonest causes for otitis externa in dogs from two polish veterinary clinics. Bulgarian Journal of Veterinary Medicine 2015;18(1):65-73.
23. Topala R, Burtan I, Fantanaru M, Ciobanu S, Burtan LC. Epidemiological studies of otitis externa at carnivores. Lucrari Stiinlifice Medicina Veterinara 2007;40:647-651.