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P Kashyap

Ph.D. Scholar, Department of Veterinary Medicine, College of Veterinary Science & A.H., Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

RS Kashyap

Ph.D. Scholar, Department of Veterinary Medicine, College of Veterinary Science & A.H., Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

SL Ali

Professor, Department of Veterinary Medicine, College of Veterinary Science & A.H., Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

HK Ratre

Professor, Department of Veterinary Medicine, College of Veterinary Science & A.H., Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

J Singh

Scientist (Senior Scale), Wildlife Health & Forensic Centre, Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

N Rawat

Assistant Professor & Head, Department of Veterinary Microbiology, College of Veterinary Science & A.H., Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

NE Gade

Associate Professor, Department of Veterinary Physiology & Biochemistry, College of Veterinary Science & A.H., Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

L Kurrey

Teaching Associate, Department of Veterinary Surgery & Radiology, College of Veterinary Science & A.H., Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

Corresponding Author:

J Singh

Scientist (Senior Scale), Wildlife Health & Forensic Centre, Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh, India

Prevalence of *Pseudomonas* associated otitis externa in dogs

P Kashyap, RS Kashyap, SL Ali, HK Ratre, J Singh, N Rawat, NE Gade and L Kurrey

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Abstract

Otitis externa is a common multifactorial inflammatory disorder of the external ear canal in dogs and a significant contributor to sensorineural hearing impairment. The present study was conducted to determine the prevalence of otitis externa and its association with age and breed. A total of 263 dogs presented with various ear affections were screened and among them, 52 dogs were diagnosed with otitis externa, yielding an overall prevalence of 19.77%. *Pseudomonas* spp. were isolated in 36.54% (19/52) of affected cases. Age-wise analysis showed the highest prevalence (46.2%) in dogs older than five years and least in dogs less than one year (7.6%). Breed-wise distribution indicated the highest occurrence in German Shepherds (30.8%) while other breeds reported least prevalence (3.9%). The study concludes that *Pseudomonas* associated otitis externa remains a prevalent clinical condition in dogs which demands early diagnosis and appropriate management to prevent chronicity and complications.

Keywords: Otitis externa, dog, *Pseudomonas*

1. Introduction

The disorder of sensorineural impaired hearing is regarded as incurable. It comprises hearing loss brought on biologically by otitis externa and hearing loss brought on physically by noise. Otitis externa, often referred to as external ear canal inflammation is one of the most frequently seen clinical illnesses, affecting 5 to 20% of dogs (Rougier *et al.*, 2005) ^[15]. Further, it is a common multifactorial chronic or recurrent illness with a prevalence as high as 20% in dogs (Korbelik *et al.*, 2019) ^[10].

The causes of otic illness, including otitis externa, are multifaceted, and microorganisms are a major contributor (Hariharan *et al.*, 2006) ^[7]. In general practice, this condition in dogs is a fairly prevalent clinical issue that is also quite difficult to treat, particularly when instances are recurring. Otitis externa may be caused by a variety of microorganisms, such as Gram-positive cocci or Gram-negative rods (Barnard and Foster, 2017) ^[2].

Clinical signs commonly associated with otitis externa include frequent head shaking, itching of the ears, foul smell coming from the ear, redness, hair loss around the affected area, and self-trauma to the region around the ear. Animals may also show sensitivity when the head is touched, discharge within the ear canal, development of an aural hematoma, and ulceration of the external ear canal. If the ear canal is thicker, rigid, and less flexible due to a persistent illness, patients may feel discomfort especially when the canal is palpated (Pye, 2018) ^[14].

2. Materials and Methods

The present study was carried out in the College of Veterinary Science and A.H., Anjora, Dau Shri Vasudev Chandrakar Kamdhenu Vishwavidyalaya, Durg, Chhattisgarh. Dogs seeking therapeutic intervention for varying ear affections presented to the Teaching Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Anjora, Durg (C.G.) and various Government Veterinary Hospitals and Private Pet Clinics in and around Durg were taken up for the present study. Relevant information regarding age, breed, sex, date of sample collection, pattern of lesion and symptoms in dogs affected with otitis externa were recorded.

Prevalence was determined by calculating the proportion of dogs diagnosed with otitis externa relative to the total number of dogs examined. The occurrence of ear disease was further analyzed according to age groups and breed categories.

3. Results and Discussion

3.1 Prevalence of otitis externa in dogs

A total screening of 263 cases presented at Teaching Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry and various Government Veterinary Hospitals and Private Pet Clinics in and around Durg district, revealed that 52 dogs had clinical cases of otitis externa, with an overall prevalence of 19.77%. The prevalence of otitis externa in dogs is shown by the data provided in Table 1 and Fig. 1.

In the present study it was found that out of 52 dogs affected with otitis externa, 19 dogs harboured *Pseudomonas* which accounted for 36.54% cases of otitis externa shown in Fig. 2. *Pseudomonas* is a gram-negative rod and is not usually isolated from a normal dog's ear.

The findings of present study are in accordance with those stated by Korbek who have reported the prevalence rate of otitis externa as 20% in dogs. The prevalence of otitis externa in dogs has also been reported to be around 20% in clinical cases of dogs (Angus, 2004; Martino *et al.*, 2016 and Choi *et al.* 2018) [1, 11, 4].

In contrast to present findings, lower prevalence of otitis externa 8.70% in dogs has been reported by Topala *et al.* (2007) [17] while O'Neill (2021) [23] have reported prevalence of otitis externa in dogs to be 7.30%. The presence of other etiological agent, parasites, ambient temperature and humidity of the particular geographical area, allergies, co-occurring diseases like dermatological and endocrine disorders, maintenance of hygiene and adoption of regular cleaning practices may all play a role in the differences between the findings of other studies and the results of the current study.

3.2 Age wise prevalence of otitis externa in dogs

The rate of prevalence of otitis externa in dogs based on the age has been presented in Table 2 and Fig. 3. The age wise prevalence was recorded as 7.6%, 15.38%, 30.8% and 46.2% in dogs of age group < 1 year, 1 to 3 years, 3 to 5 years and > 5 years respectively.

Highest prevalence of otitis externa (46.2%) was observed among dogs older than five years of age. A number of studies carried out by various workers have also documented that dogs between 5-8 years of age were mostly affected. Topala *et al.* (2007) [17] reported that 16.2% dogs between 1-2 years, 28.2% dogs between 2-5 years and 33.4% dogs between 5-8 years were affected with otitis externa. Similarly, observation made by Dziva *et al.* (2015) [5] also indicated that the otitis externa appears to occur more in older than in younger dogs.

The findings of our study indicate that all age groups of dogs may suffer from otitis externa. However, frequency of occurrence is higher in dogs which have attained age of more than five years. The higher rate of prevalence could be correlated initially with activity of sebaceous gland which is under the influence of androgen hormones but in subsequent stage of age, it might be correlated with the reduction in the immunity and initiation of degenerative process. However, Nair (2004) [12] reported higher incidence of otitis externa in dogs aged between 1-6 years. Similarly, Fernandez *et al.* (2006) [6] and Roy *et al.* (2018) [16] observed a higher incidence of otitis in dogs between 2 and 5 months of age. In contrast to these reports, Zur *et al.* (2011) [19] have opined that there is no

correlation of age in dogs for occurrence of otitis externa.

3.3 Breed wise prevalence of otitis externa in dogs

The breed wise prevalence of otitis externa has been represented in Table 3 and Fig. 4. The obtained data of the present study revealed that there was uneven distribution in various breeds of the dogs in relation to occurrence of otitis externa. The reasons of this uneven rate of prevalence could be due to various factors viz. anatomy of ear canal and pinna, moisture, trauma, hairy or pendulous ear etc. During the present study, the highest occurrence of otitis externa was observed in German shepherd (30.8%) followed by Spitz (15.4%), Labrador retriever (11.6%), Rottweiler (9.6%), Pug (7.6%), Doberman (7.6%), Cocker spaniel (5.7%), Dalmatian (3.9%), Saint Bernard (3.9%) and others (3.9%).

The findings of the present study are in accordance with the reports of Kiss *et al.* (1997) [9] who have also recorded the highest incidence of otitis externa in German shepherd (28.5%) followed by Cocker spaniel (19%), Cross breed (19.9%) and Miniature poodle (8.3%). Similarly, Chaudhary and Mirakhr (2002) [3] also recorded higher (31.14%) incidence of otitis in German shepherd breed followed by Spitz breed (29.87%).

Contrary to the findings of present study, Fernandez *et al.* (2006) [6] reported higher incidence of otitis externa in Poodle (30.19%) followed by Mongrel (26.42%), Cocker spaniel (16.98%) and German shepherd (9.49%). Higher incidence of otitis externa was reported in our study in German shepherd breed might be due to hyperactivity of cerumen producing glands. However, Yoshida *et al.* (2002) [18] have reported no significant difference among breeds for occurrence of otitis externa in dogs.

Table 1: Showing prevalence of otitis externa in dogs

Number of dogs examined	263
Number of dogs positive for otitis externa	52
Prevalence (%)	19.77
Number of dogs positive for otitis externa caused by <i>Pseudomonas</i> spp.	19
Prevalence (%)	36.54

Table 2: Age wise prevalence of otitis externa in dogs

Age	No. of dogs examined	No. of positive Prevalence cases (n = 52)	Prevalence (%)
< 1 year	30	4	7.6
1 - 3 years	73	8	15.4
3 - 5 years	68	16	30.8
> 5 years	92	24	46.2
Total	263	52	100

Table 3: Breed wise prevalence of otitis externa in dogs

Breed	No. of dogs examined	No. of positive cases (n = 52)	Prevalence (%)
German Shepherd	61	16	30.8
Spitz	33	8	15.4
Labrador Retriever	49	6	11.6
Rottweiler	27	5	9.6
Pug	23	4	7.6
Doberman	11	4	7.6
Cocker Spaniel	10	3	5.7
Dalmatian	12	2	3.9
Saint Bernard	13	2	3.9
Others	24	2	3.9
Total	263	52	100

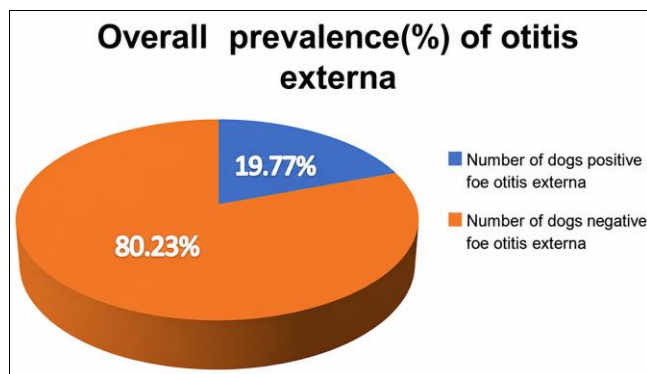


Fig 1: Overall prevalence (%) of otitis externa

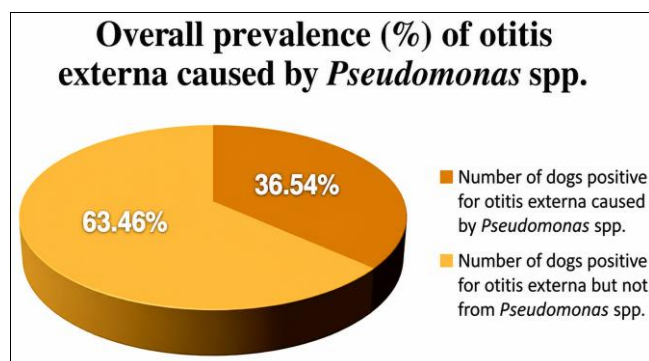


Fig 2: Overall prevalence (%) of otitis externa caused by *Pseudomonas* spp.

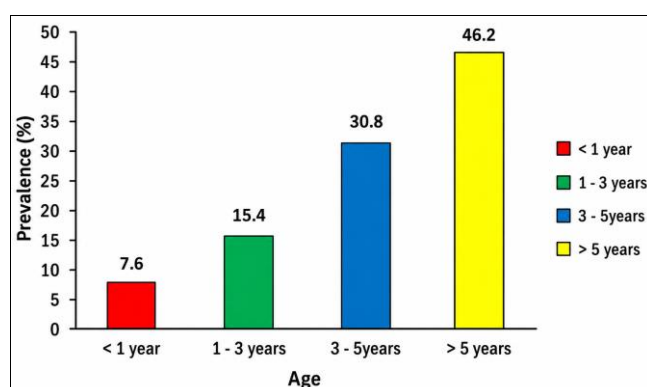


Fig 3: Age wise prevalence of otitis externa in dogs

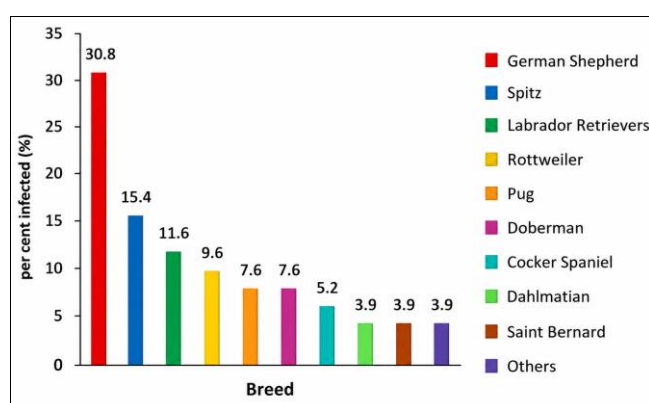


Fig 4: Breed wise prevalence of otitis externa in dogs

4. Conclusion

The overall prevalence of otitis externa in dogs was 19.77% (52/263) with prevalence of *Pseudomonas aeruginosa* to be 36.54% (19/52) among clinical cases of otitis externa. Highest number of dogs (46.2%) aged above 5 years and German

shepherd (30.8%) breed were most commonly affected dogs affected with otitis externa.

Conflict of Interest

Not available.

Financial Support

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