ABSTRACT

The purpose of this retrospective study was to compare outcome measures in dogs treated by a primary care veterinarian (pcDVM) before referral and after seeking collaboration with a board-certified veterinary dermatologist (BCVD) for cases of severe recurrent chronic otitis externa. Medical records of 65 client-owned dogs were retrospectively reviewed, and data were obtained regarding treatment history, referral timeframe, recurrence rate, clinical signs, and resolution of signs. The median number of otitis recurrences while under the care of the pcDVM was 4 (range 1–40) versus collaborative BCVD care of 2 (P < .01). There was a longer median time to otitis recurrence with collaborative care (171 days) compared with dogs managed by the pcDVM before referral (21 days; P > .01). Proliferative changes in the ear canals improved in 41/45 (91%) of cases under BCVD care compared with 6/45 (13%) under care by the pcDVM (P < .01). Dogs with chronic otitis had better long-term outcomes when collaboration with a BCVD was pursued within 6 mo of treatment. Referral or consultation with a BCVD should be considered for cases of chronic canine otitis that are persistent or quickly recurrent (20–30 days) over a 6 mo period. (J Am Anim Hosp Assoc 2021; 57:212–216. DOI 10.5326/JAAHA-MS-7167)

Introduction

Otitis externa is one of the most common presenting complaints in small animal veterinary practices and can present with a variety of challenges. The epithelium of the external ear canal is an extension of the skin, and therefore, otitis externa is commonly a manifestation of generalized dermatologic disease, such as atopic dermatitis. Successful management of these cases depend on an understanding of the primary, predisposing, and perpetuating factors involved in the pathogenesis of otitis externa. Failure to identify these contributing causes is the most common reason why treatment may fail. Successful treatment can be further complicated by secondary bacterial and yeast infections, with the four most common causative bacterial agents of canine otitis being staphylococci, Pseudomonas spp., Proteus spp., and streptococci. Appropriate antimicrobial therapy is important, because improper, prolonged usage or inappropriate antibiotic choice may lead to multidrug resistance. Although many cases are successfully managed by the primary care veterinarian (pcDVM) with conventional therapy, it is not uncommon for recurrence to develop or for progression to a chronic disease state to occur. Progression of chronic otitis externa may result in irreversible proliferative changes to the epithelium, resulting in narrowing of the canal, stenosis, pain, and the need for surgical intervention (i.e., total ear canal ablation and bulla osteotomy). For these chronic cases, one resource for pcDVMs is consultation or referral to a board-certified veterinary dermatologist (BCVD). These veterinarians have expertise and specialized training in the diagnosis and treatment of animals with benign and malignant disorders of the skin, hair, ears, and nails. They are members of the American College of Veterinary Dermatology (ACVD), an American Veterinary Medical Association-funded specialty college.

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ACVD (American College of Veterinary Dermatology); BCVD (board-certified veterinary dermatologist); pcDVM (primary care veterinarian)

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The purpose of this study was to evaluate outcomes in dogs treated by pcDVM before referral and then when collaboration with a BCVD was employed after referral, in the same cohort of dogs. Furthermore, it aimed to determine the best timing for referral. We hypothesize that collaboration with a BCVD would result in improved outcomes for dogs with chronic otitis externa.

Materials and Methods

Criteria for Case Selection

Medical records of canine patients diagnosed with chronic otitis externa between September 2006 and March 2017 were collected from 17 private and university specialty referral practices across the United States and reviewed retrospectively. Qualifying specialists needed to be board certified by the ACVD and part of a specialty practice that had received at least one chronic otitis externa referral from a pcDVM within the past 3 mo. For the otitis to be considered chronic, it had to be persistent or recurrent while under the pcDVM care for at least 3 mo before referral to the BCVD. The BCVD must also have had access to at least 1 yr of the pcDVM’s medical records documenting chronic otitis externa treatments, dates of treatment, and outcomes. Additionally, the dog must have been under the care of a dermatologist for a minimum of 5 mo to ensure there were no relapses. Exclusion criteria included owners who were noncompliant for the pcDVM or the BCVD and end-stage ear disease in which a total ear canal ablation surgery was recommended for the first or second visit with the dermatologist. Dogs with chronic otitis externa that were not referred for collaborative care were not included in this study.

Data Collection

Medical records of eligible cases were reviewed, and data were entered into an online survey platform hosted by an independent market research firm. For each dog included in the study, data extracted from the pcDVM’s medical record included age, weight, sex, and breed as well as the first instance of otitis mentioned in the records, otitis treatments, clinical signs, when the case was referred, and when signs resolved. Specific data regarding time to resolution of clinical signs and recurrence while under pcDVM care were collected first. Subsequently, these same data were collected while the patient was under collaborative BCVD care. Outcomes evaluated included time to complete resolution of otic infections/inflammatory signs, the frequency and interval of otitis recurrences, and improvement or resolution of any proliferative changes to the ear canal. Complete resolution was defined as (1) the total absence of odor, erythema, discharge, pruritus, pain, edema, and infection and (2) no relapses of clinical signs during the period the dog was under the dermatologist’s care (minimum of 5 mo). Discontinuation of all therapies was not a requirement for definition of complete resolution because many underlying causes of otitis externa require lifelong management.

Statistical Analysis

Statistical comparisons were conducted to determine if there were any significant differences between disease progression and resolution while under the care of each type of veterinarian. Statistical comparisons were conducted using SAS/STAT software version 9.4 to determine whether any significant differences existed in disease progression or resolution in dogs under collaborative care versus pcDVM care alone.

Frequency and interval of time between otitis recurrences are reported as median number of episodes and days, respectively. Resolution of inflammatory signs and improvement or resolution of proliferative changes were reported as proportions. Bivariable comparisons between types of care were performed with the Wilcoxon signed rank test (rate of otitis recurrences), McNemar’s test (resolution of external signs), and McNemar’s exact test (improved resolution of proliferative changes). Values of $P < .05$ were considered significant.

Results

A total of 77 dogs were identified for analysis. Twelve dogs were excluded for not meeting the criteria of being treated by the BCVD for a minimum of 5 mo, leaving a total of 65 records for analysis. Thirty (46%) dogs were castrated males, 32 (49%) were spayed females, 3 (4%) were intact males, and there were no intact females. Age of dogs ranged from 2 yr to 15 yr (median 9 yr), and 57% of dogs were $<22.7$ kg (49.9 lbs). Thirty-one breeds were represented with cocker spaniels ($n = 12$, 18%) and Labrador retrievers ($n = 8$, 12%) being the most common.

Of the 65 dogs treated by BCVDs for chronic otitis externa, records indicated that 61 dogs presented with clinical signs including otic pruritus, pain, and/or discharge. The otitis had been present before referral for a median of 10 mo (range 3–89 mo). Of the 65 dogs, 18 (28%) had continuous otitis whereas 47 (72%) were recurrent. The median number of recurrences before referral was 12 (range 1–40). The number of days between recurring otitis ranged from 0 to 210 days (median 21 days). The length of time of the current otitis diagnosis at referral ranged from 14 to 1440 days (median 90 days). At the time of presentation, 45 (69%) dogs had some degree of proliferative changes in one or both ear canals. Of these 45 cases, only 36 had been noted in the pcDVM’s records as having proliferative changes.

Dogs remained under the care of a BCVD for a range of 5–76 mo (median 12 mo). After the first visit to the dermatologist, 34 (52%) had complete resolution of odor, erythema, discharge, pruritus, pain,
edema, and infection, 27 (42%) had improvement in clinical signs and discomfort, and 4 (6%) had no change. The most common reasons reported to result in partial resolution or no change were underlying allergies or chronic proliferative changes to the ear canal. The number of days to complete resolution ranged from 5 to 420 days (median 35 days). The most common underlying cause of otitis externa was atopic dermatitis 61/65 (93.8%). Of these, 49 dogs were diagnosed as environmental allergic (75%), 10 were food allergic (15%), and 2 had undefined allergies (3.1%). Additional causes included two neoplasia and one each of keratinization disorder and anatomical anomaly. Both pcDVMs and BCVDs used topical antimicrobials and topical steroids as treatment modalities at approximately the same rate; however, BCVD usage of oral glucocorticoids was higher than pcDVMs (46 dogs, 71% compared with 30 dogs, 46%) (Figure 1). BCVDs also performed deep ear cleanings under general anesthesia at a higher rate than pcDVMs (36 dogs, 55% compared with 2 dogs, 3%).

Outcome Comparisons

Disease Recurrence Comparison

Excluding dogs that were free of recurrence (n = 34; 52%), dogs under collaborative BCVD care (n = 31) stayed recurrence-free longer, with a median of 171 days after therapy completion (range 63–572 days), which was significantly (P < .01) longer than before referral (median 21 days; range 0–618 days). The median number of recurrences for all cases while under the care of the pcDVM was 4 (range 1–40) versus the BCVD of 2 (range 0–12; P < .01). Proliferative changes in the ear canals improved in 41/45 (91%) of cases under BCVD care compared with 6/45 (13%) under care by the pcDVM (P < .01).

Comparison of Dermatologist Outcome

There were three possible outcomes for a patient referred to the dermatologist. The first outcome was complete resolution of the otitis and no recurrences under the dermatologist’s care (the dermatologist usually continued to see the case to manage the underlying allergic disease). This meant the acute signs of otitis, including but not limited to pain, swelling, discharge, and infection, were completely resolved, but proliferative changes in the canal could still be present. The second outcome was resolution of the acute signs of otitis including infection but recurrence of these signs during the time the case was managed by the dermatologist. The final outcome were cases in which the dermatologist felt medical management was not going to be successful.

Of the 65 dogs, 27 (41.5%) were considered to have the first outcome. These dogs had been actively treated for otitis by the pcDVM for 4–89 mo (median 10 mo) with a median time of 30 days between bouts of otitis (range 0–180 days) before being referred to the dermatologist. Once seen by the dermatologist, the active otitis and infection were cleared in a median of 35 days with a range of 14–180 days. Proliferative changes were noted by the dermatologist in 14/27 cases (51.9%). Of these, 5/14 resolved completely, and 9/14 showed improvement in
the proliferative changes while under the dermatologist’s care. These cases were followed by the dermatologist for a median of 8 mo with a range of 5–27 mo.

Of the 65 dogs, 28 (43.1%) had the second outcome—recurrent otitis while under the dermatologist’s care. These dogs had been actively treated for otitis by the pcDVM for 7.5 mo (median) with a range of 3–85 mo and a recurrence rate of a median of 21 days (range 0–210 days) before referral to the dermatologist. Under the dermatologist’s care, the acute otitis and infection were cleared in a median of 33 days (range 14–120 days). The times between bouts under the dermatologist’s care were a median of 120 days with a range of 21–420 days. Proliferative changes were noted in 17/28 cases (60.7%). Of these, 5 cases resolved completely, 9 improved, and 3 stayed the same. These cases were seen by the dermatologist for a range of 6–49 mo with a median of 22 mo.

Ten dogs (15.4%) had the third outcome. Of these, three had ear canal ablation surgery recommended by the dermatologist; one had a tumor in the ear canal, but the client refused surgery, and one had recalcitrant lymphoma with enlarged mandibular lymph nodes that closed off the ear canal. One dog had abnormal anatomy that led to recurrent otitis. The other four dogs were considered to have proliferative changes with or without calcification that were not responding to medical therapy, and surgery would be the treatment of choice but was not an option for the clients for various reasons including financial. These cases had been treated by pcDVM for a median of 10.7 mo with a range of 8–36 mo with a median time between bouts of 0 days (range 0–60 days).

Following BCVD treatment for chronic otitis, 18% (9/50) of owners indicated they took their dog to a new pcDVM rather than return to their referring pcDVM. Pet owners indicated they changed to a new pcDVM because their dogs were not referred to a specialist for otitis treatment in a timely manner.

Discussion

The goal of this study was to determine whether collaborative care resulted in improved patient outcomes in dogs with chronic otitis externa. Under collaborative BCVD care, the percentage of dogs with complete resolution of clinical signs and infection, in addition to resolution or improvement of proliferative ear canal changes, was significantly higher. Furthermore, the number of recurrences was reduced. Long-term outcomes were noted to be worse for dogs managed by pcDVMs who were unable to control the otitis for over 6 mo. Earlier and more effective therapy may help avoid excessive prolonged treatment courses and the need for surgical removal of the ear canal.

This study did not investigate reasons why collaborative care achieved better results. Some possibilities include dermatologists’ expertise in performing deep ear cleanings under general anesthesia as well as using oral glucocorticoids to treat chronic otitis. BCVDs were also more likely to investigate, diagnose, and control the underlying cause of otitis compared with pcDVMs. In a recent survey of dermatology clients by the ACVD (American College of Veterinary Dermatologists, unpublished white paper, 2020), 46% of the diagnoses made by the pcDVM did not match the diagnosis made by the BCVD. This likely plays a major role in treatment failures and recurrence of dermatologic issues managed by the pcDVM. Information regarding secondary bacterial or yeast infections was not collected for this study, because the primary focus was differences in outcomes regardless of underlying causes or perpetuating factors. Other limitations include the retrospective nature of the study with variations in treatment protocols between pcDVMs and BCVDs. It is difficult to determine whether treatments employed by the pcDVM had a positive or negative effect on the clinical status of the dog at the time of presentation to the BCVD. Furthermore, the knowledge of treatments employed by the pcDVM before referral may affect treatment decisions made by the BCVD. Regardless, it is the advanced training and expertise of the BCVD that allows them to select an appropriate treatment plan based on the entire case presentation. Although proliferative changes were noted in 69% of dogs, only 55% of pcDVMs recognized these changes; this demonstrates the discrepancy in subjective evaluation of chronic changes to the ear canal between pcDVMs and BCVDs. Additionally, barriers for referral were not investigated, and therefore it cannot be determined if timing to referral was affected by financial limitations, distance, or other factors.

Furthermore, it can be difficult for primary care practitioners to decide when to refer a patient, particularly for nonlethal conditions such as otitis. Referring too early can be an extra financial burden for the client that may not be necessary; however, waiting too long can lead to prolonged discomfort/pain for the patient and progression of the disease to a point that it is no longer treatable medically.

This study showed that once a patient had chronic otitis externa, the longer the patient was under the care of the pcDVM without referral, the higher the number of recurrences and the longer the duration of the episodes of otitis. Both factors can lead to increased pain for the dog and increased distress for both the dog and owner along with increased expense for the owner. In several dogs, it also led to surgical removal of the ear canal. Finally, some clients did not return to their pcDVM because of a delay in referral. This agrees with data that were collected in the recent ACVD survey (American College of Veterinary Dermatologists, unpublished white paper, 2020), which demonstrated that clients tended to become frustrated with their pcDVM if their dog’s dermatologic problems were not controlled or diagnosed after three visits. In the ACVD survey, 15% of the clients who reached this time point did not return to their pcDVM for basic care, and 38% would not return for more significant issues.
Evaluating the benefits of collaborative interventions have been extensively evaluated throughout the human literature for a variety of conditions, such as heart failure, depression, panic disorder, Alzheimer’s disease, and chronic pain.\textsuperscript{15–23} With collaborative care, there are improved outcomes, improved quality of life, decreased pain, and in some cases longer mean survival times. In the veterinary literature, investigations into the impact of collaborative care continue to grow. Collaborative care provided to small-breed dogs with chronic heart failure by a board-certified veterinary cardiologist and pcDVM resulted in survival benefits for affected dogs and increased revenue for pcDVMs, compared with care provided by a pcDVM alone.\textsuperscript{24}

The pcDVM is most familiar with the animal’s medical history and can provide guidance, support, and follow-up for their patients, whereas the specialist can offer advanced services, knowledge, and skill in a specific discipline. Clearly, a partnership between the pcDVM and specialist is essential for providing optimal patient care, and further research highlighting these benefits will help define best practice recommendations and support healthy collaboration between primary and specialty care providers.

\textbf{Conclusion}

Collaboration with BCVDs resulted in resolution of clinical signs, reduced recurrence, and improved outcomes in dogs presenting with chronic otitis externa. This is likely because of the BCVDs expertise in investigation, diagnosis, and controlling the underlying cause of otitis, particularly atopic dermatitis, which is crucial for sustained resolution of clinical signs. Referral or consultation with a BCVD should be considered for cases of chronic canine otitis that are persistent or recurrent (20–30 days) over a 6 mo period.

The Collaborative Care Coalition is a nonprofit committed to providing veterinarians with continuing qualitative and quantitative research related to referral outcomes in a variety of common disease scenarios. The Collaborative Care Coalition’s goal is to help pcDVMs and specialists work together more effectively to help pets lead longer, healthier lives.

\textbf{FOOTNOTES}

\footnotemark{a} MarketVision Research, Cincinnati, Ohio
\footnotemark{b} SAS/STAT software, version 9.4; SAS Institute, Inc., Cary, North Carolina

\textbf{REFERENCES}


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