Original Articles

Survey of Migraine Sufferers with Dogs to Evaluate for Canine Migraine-Alerting Behaviors

Dawn A. Marcus, MD[1] and Amrita Bhowmick, MPH[2]

Abstract

Objectives: Anecdotal reports suggest that changes in dog behavior might be used to predict impending migraine episodes. This survey was designed to investigate how companion dogs react to migraines that occur in their owners.

Design: Online survey was available from January 4–31, 2012.

Settings/location: Survey was conducted through SurveyMonkey, with links to the survey posted at Migraine.com and promoted through social media.

Subjects: Adults ≥18 years old who experience migraine episodes and live with a dog were eligible to participate.

Interventions and outcome measures: Participants completed an 18-question online survey that asked about participant demographics, migraines, and their dog's behavior before or during migraine episodes.

Results: The survey was completed by 1029 adult migraineurs (94.9% women), with migraines typically occurring ≤8 days per month in 63.4% of participants. A recognized change in the dog's behavior prior to or during the initial phase of migraine was endorsed by 552 participants (53.7%), most commonly unusual attentiveness to the owner (39.9%). Among the 466 participants providing details about their dog's behavior with their migraines, 57.3% were able to identify dog alerting behavior before symptoms of a migraine attack would typically begin, with changes usually noticed within 2 hours before the onset of initial migraine symptoms. The dog's behavior was considered to be often or usually linked with the development of a migraine for 59.2% of migraineurs, and 35.8% of migraineurs endorsed beginning migraine treatments after the dog's behavior was recognized and before migraine symptoms had started. Participant demographics, migraine frequency, and breed of dog in the home were similar between the 470 participants with no alerting behavior endorsed and the 466 participants providing detailed alerting information.

Conclusions: About one in four migraineurs living with a companion dog endorsed recognizing a change in their dog's behavior before recognizing initial symptoms of a migraine attack.

Introduction

AMONG PATIENTS WITH MEDICAL CONDITIONS that have episodic symptom occurrence, the onset of symptoms may be heralded by premonitory changes. For example, among patients with diabetes in whom hypoglycemia was induced ($N = 45$ type I and $N = 20$ type II diabetes), premonitory changes of early low blood sugar were identified by about half of the patients (51% with type I and 55% with type II diabetes).[1] Likewise, surveys of patients with epilepsy reported 6%–39% of patients recognize premonitory changes occurring in advance of impending seizures.[2–4] Anecdotally, premonitory symptoms have been noted by both patients and outside observers (e.g., family, friends, or coworkers). The advantage of being able to successfully predict impending disabling symptoms while still being relatively asymptomatic and unimpaired has led to the training of medical detection service dogs to alert their humans to impending problematic symptoms, such as hypoglycemia[5] and seizures.[6]

In a previously published study, Wells and colleagues[7] evaluated the ability of companion dogs to detect and alert owners with diabetes to impending symptomatic hypoglycemia. Among the 212 patients with type I diabetes who were also dog owners surveyed in this study, 65% noted their dog had shown a behavioral change to at least one hypoglycemic episode, with 32% of respondents reporting >10 incidents where the dog's

¹Department of Anesthesiology, University of Pittsburgh, Pittsburgh, Pennsylvania.
²Health Union, LLC, Philadelphia, Pennsylvania.

behavior changed in relation to hypoglycemia. In addition, 36% identified a consistent link between the dog's behavior and hypoglycemia and 34% reported the dog's behavioral change preceded the patient's clinical awareness of hypoglycemia. Typically, dogs' behavioral changes consisted of increased attention toward the owner, including vocalizing, licking, nuzzling, jumping onto the person, and intent staring. The ability of companion dogs to alert their owners to impending symptomatic hypoglycemia would permit preemptive interventions to avoid the development of disabling hypoglycemia.

Migraine is similarly an episodic disorder with disabling attacks often preceded by subtle changes during the hours before the painful part of the attack, called the migraine prodrome. The migraine prodrome includes changes in mood; food cravings; digestive symptoms; yawning; frequent urination; neck pain; and neurological symptoms (e.g., difficulty concentrating, dizziness, blurred vision, and sensitivity to noise or lights).[8,9] About one in three migraineurs can identify their prodrome, which provides an opportunity to initiate early migraine treatment that can successfully reduce or eliminate more painful and disabling symptoms of the subsequent migraine attack.[10] Early treatment of migraine, when symptoms are first identified, has been an important focus of migraine patient education, since currently available therapies are typically most effective when treating milder symptoms.[11–14] Identifying the prodrome can be particularly helpful because acute treatment during the prodrome or prior to the painful stage of migraine can reduce the severity of the headache phase or prevent the development of a full migraine attack.[15–19]

A previous small cases series ($N=8$) catalogued behaviors in companion pet dogs that their owners with migraine identified as being linked with migraine episodes.[20] Unique alerting behaviors were consistently identified within minutes to 24 hours before the onset of migraine symptoms. A range of dog breeds was represented, and alerting behaviors were recognized in puppies as well as adult dogs, typically within months of the dog first starting to live with the individuals with migraines. Behaviors were similar to those reported for diabetes alerting companion dogs by Wells and colleagues,[7] including increased attentiveness, vocalizations, and pawing at the migraineur. In one case, the dog was noted to have reduced vocalizations about 20–30 minutes before a migraine, ignoring stimuli that would normally result in barking. The current survey was designed to provide a broader sampling of individuals with migraine to evaluate whether they had identified migraine-alerting behaviors in their pet dogs. This survey sought to recruit a sample adult migraineurs living with a dog to help determine the prevalence of migraine-alerting behavior that might be recognized in typical companion dogs.

Methods

Data were collected through an online survey that was available from January 4, 2012, to January 31, 2012. Prior to initiation of this survey, this study was reviewed and approved by a local Institutional Review Board. Participants were informed about the voluntary nature of the survey, information being collected, anonymous nature of data collection, and the expected time for survey completion. No personal identifiers were collected or stored with the data.

Recruitment

This survey aimed to recruit adults with migraine who lived with one or more dogs. Potential subjects were recruited as a convenience sample. Links to the survey were posted on Migraine.com, with additional notifications through related Facebook and Twitter pages. Adults ≥18 years old were eligible to participate in the survey if they endorsed experiencing migraines and living with a dog as an adult since their migraines began. No specific criteria were required to be met for the migraine diagnosis, which could have been based on self-report or health care provider diagnosis. Responses were completely anonymous, with no identifiers collected; however, participants' IP addresses were used to ensure the questionnaire could only be completed once by any individual. Duplicate entries were avoided by preventing users with the same IP address access to the survey more than once during the study period.

Electronic survey

Electronic data collection was conducted through SurveyMonkey, with data protected through their security measures. After reviewing information about the nature of the survey, participants were provided with an 18-question survey that would require about 15 minutes to complete (see Appendix). After completing the initial inclusion questions, all participants were asked to provide information about demographics and migraines, their current dog(s), and whether their dog displayed any potential migraine-alerting behaviors. Participants responding positively to the alerting questions were then asked additional questions about the dogs displaying the behavior, the specific behaviors identified, and the temporal relationship of these behaviors with regard to migraine attacks.

Data analysis

Data were evaluated using descriptive statistics. Categorical variables were assessed using chi-square statistical significance test; a cutoff of $p < 0.05$ was utilized for statistical significance. Correlation analyses were performed to investigate potential relationships between demographic and migraine characteristics and dog alerting behavior.

Results

Subjects

A total of 1029 adult migraineurs met inclusion criteria (Fig. 1). Most participants were women (94.9%), with migraines typically occurring ≤8 days per month in 63.4% of participants (Table 1). Dog breeds most commonly living with participants were mixed breeds, sporting dogs, toy dogs, and terriers. Demographics were similar for those individuals completing the detailed dog-alerting questions. The widely accepted International Classification of Headache Disorders (ICHD-II) criteria divide migraine into episodic migraine (defined as having <15 attacks per month) and chronic migraine (migraine occurring ≥15 days per month).[21] Among the full sample ($N=1029$) and those answering the detailed alerting questions ($N=466$), respectively, episodic migraine was endorsed by 769 and 350 individuals (77.4% and 75.1%), with chronic migraine in 233 and 116 individuals (22.6% and 24.9%).
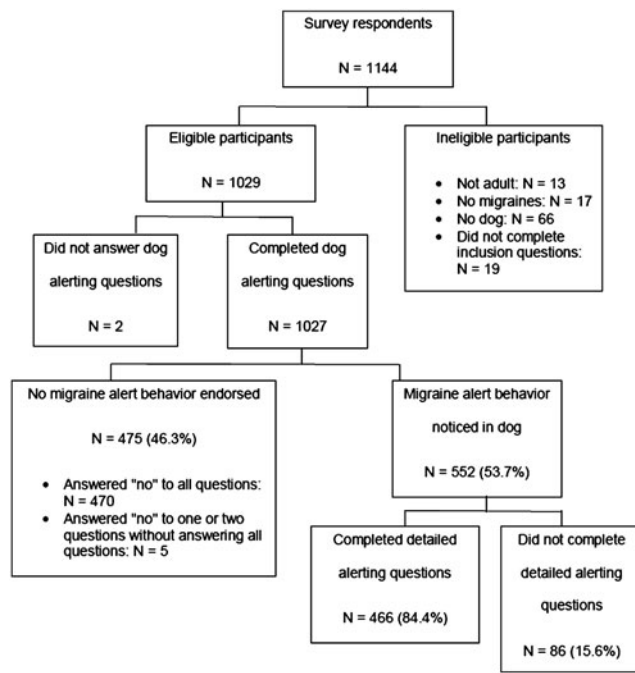
FIG. 1. Recruitment.

Migraine-alerting behaviors

A migraine-alerting behavior was endorsed by 534 survey participants (52.0%), with 466 participants providing detailed information about alerting behavior (45.3% of the full sample). The percentage of people endorsing each alerting question is shown in Figure 2. The age of a dog who had lived with a person since puppyhood or duration an older dog had lived with a migraineur before alerting behavior was recognized was distributed fairly evenly between 0–6 months and >2 years (Figure 3).

Participant demographics, migraine frequency, and breed of dog in the home were similar between the 470 participants with no alerting behavior endorsed and the 466 participants providing detailed alerting information.

The most commonly endorsed individual alerting behavior was the dog refusing to leave the migraineur (Table 2). The number of individual behaviors selected by participants was one behavior for 216 participants (46.4%), two behaviors for 137 (29.4%), three behaviors for 66 (14.2%), four behaviors for 34 (7.3%), and more than four behaviors for 13 (2.8%) Among those individuals endorsing "other" alerting behaviors, the most commonly reported behaviors were excessive and persistent licking ($N=25$) and sitting or lying on the migraineur ($N=21$). Other frequently reported behaviors were the dog sitting close and staring at the migraineur, restricting its usual activity level, and herding the migraineur to a couch or bed. Among those people endorsing a change in their dog's behavior with their migraines, 57.3% were able to identify the dog's alerting behavior before symptoms of a migraine attack would typically begin (Table 2). Time between the dog's behavior and subsequent initial migraine symptoms was 0–30 minutes for 46.0% of migraineurs who typically noticed a change in their dog's behavior in advance

TABLE 1. SUBJECT CHARACTERISTICS

Characteristic	*No. (%)*	
	Full included sample N = 1029	*Participants answering detailed dog alerting questions* N = 466
Sex		
Male	52 (5.1)	21 (4.5)
Female	977 (94.9)	445 (95.5)
Age, years		
≤21	18 (1.7)	9 (1.9)
22–34	222 (21.6)	106 (22.8)
35–44	333 (32.4)	154 (33.1)
45–54	302 (29.3)	135 (29.0)
55–64	136 (13.2)	57 (12.2)
≥65	18 (1.7)	5 (1.1)
Migraine frequency, no. per month		
0–3	359 (34.9)	144 (30.9)
4–8	293 (28.5)	138 (29.6)
9–14	144 (14.0)	68 (14.6)
15–20	122 (11.9)	64 (13.7)
21–25	46 (4.5)	21 (4.5)
>25	65 (6.3)	31 (6.7)
Type of dog(s) lived with since being an adult with migraine[a]		
Sporting dogs (e.g., Spaniels, Retrievers, Pointers)	262 (25.5)	127 (27.3)
Hound	115 (11.2)	63 (13.5)
Terrier (e.g., Terriers and Pit bulls)	239 (23.2)	111 (23.8)
Working dog (e.g., Akita, Doberman, Great Dane, Husky, Mastiff, Newfoundland, Portuguese water dog, Rottweiler)	172 (16.7)	86 (18.5)
Toy dog (e.g., Chihuahua, Chinese crested, Pomeranian, Toy/Miniature poodle, Pug)	244 (23.7)	121 (26.0)
Non-sporting (e.g., Bulldog, Dalmatian, Standard poodle)	69 (6.7)	32 (6.9)
Herding (Cattle dog, Collies, Corgi, German shepherd, Sheepdog)	195 (19.0)	91 (19.5)
Mixed breed	315 (30.6)	143 (30.7)
Other	108 (10.5)	57 (12.2)

[a]Subjects could select >1 breed.

of initial migraine symptoms. A total of 35.8% of migraineurs endorsed beginning migraine treatments after the dog's behavior was recognized and before migraine symptoms had started. The dog's behavior was felt to be often or usually linked with the development of a migraine for 59.2% of
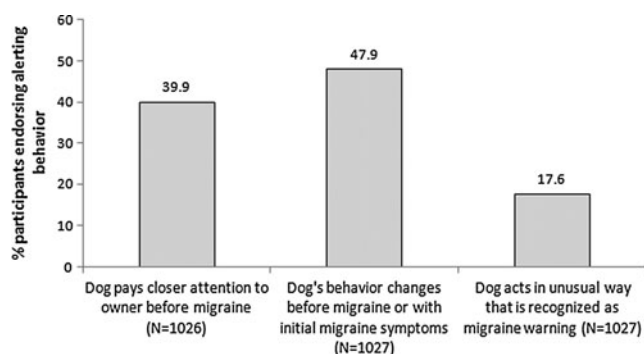
FIG. 2. Percentage of dog-owning migraineurs who endorsed recognizing migraine alerting behaviors in their dogs.

migraineurs. The most commonly represented alerting breeds were fairly evenly distributed among mixed breeds, toy breeds, terriers, and sporting dogs.

A total of 369 survey participants responded to the free-response question to describe their dog's behavior. Both alerting behaviors occurring in advance of migraine and comforting behaviors after symptoms began were described. Commonly described alerting behaviors included the dog being excessively attentive to the migraineur ("clingy," "glued to my side," and "Velcro dog" were terms used repeatedly), intense staring, frantic licking, pawing, and whining. Representative descriptions are provided in Exhibit 1.

Discussion

This survey showed that half of migraineurs with dogs were able to identify behavioral changes in their dogs with migraine episodes before or during the initial stages of a migraine attack. For 26% of all migraineurs surveyed, a change in the dog's behavior was recognized by the migraineur as occurring in advance of symptoms of a migraine episode. In addition, 36% of those endorsing a change in their dog's behavior with migraine reported treating their migraines after recognizing the dog's behavior and before the first migraine symptom.
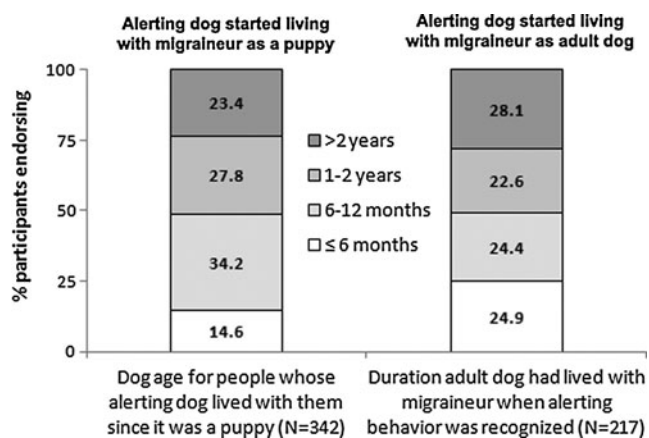

FIG. 3. Initiation of migraine-alerting behavior in companion dogs. Some participants noted migraine-alerting behavior in more than one dog, with some having experience with both dogs living with them as a puppy and dogs acquired as adults.

TABLE 2. MIGRAINE-ALERTING BEHAVIORS BY COMPANION DOGS (N=466)

Characteristic	No. (%)
Alerting behavior[a]	
Staring at migraineur	126 (27.0)
Barking at migraineur	15 (3.2)
Sitting on migraineur	103 (22.1)
Refusing to leave migraineur's side	364 (78.1)
Whining	56 (12.0)
Pawing at migraineur	101 (21.7)
Other	130 (27.9)
Duration between alerting behavior and initial migraine symptoms	
0–15 minutes	52 (11.2)
16–30 minutes	70 (15.0)
31–60 minutes	65 (13.9)
Between 1 and 2 hours	60 (12.9)
>2 hours before migraine	20 (4.3)
Migraine symptoms usually begin before noticing dog's behavior	199 (42.7)
Duration between recognizing alerting behavior and treating migraine	
As soon as the dog's behavior is recognized	37 (7.9)
Sometime between the dog's behavior and the first migraine symptoms	130 (27.9)
After migraine symptoms have started	179 (38.4)
Migraine treatment usually already started before dog's alerting behavior begins	120 (25.8)
Consistency of alerting behavior and development of migraine	
Occasionally linked	53 (11.4)
Sometimes linked	82 (17.6)
Often linked	143 (30.7)
Usually linked	133 (28.5)
Treatment started when dog alerts before migraine, so unknown	55 (11.8)
Dog breed that alerts to migraine[a]	
Sporting dogs (e.g., Spaniels, Retrievers, Pointers)	89 (19.1)
Hound	46 (9.9)
Terrier (e.g., Terriers and Pit bulls)	91 (19.5)
Working dog (e.g., Akita, Doberman, Great Dane, Husky, Mastiff, Newfoundland, Portuguese water dog, Rottweiler)	63 (13.5)
Toy dog (e.g., Chihuahua, Chinese crested, Pomeranian, Toy/miniature poodle, Pug)	99 (21.2)
Nonsporting (e.g., Bulldog, Dalmatian, Standard poodle)	25 (5.4)
Herding (Cattle Dog, Collies, Corgi, German shepherd, Sheepdog)	70 (15.0)
Mixed breed	100 (21.5)
Other	63 (13.5)

[a]Subjects could select >1 response.

Individuals aware of their dog's behavior changes before migraine attacks might use this information to begin acute migraine therapy to ward off a severe migraine episode. For those individuals whose migraine symptoms typically had started before noticing the dog's behavior (43% of those participants endorsing changes in dog behavior with migraine), it is possible that these behaviors might have been identified during earlier stages of migraine when symptoms

are more amenable to treatment or patients might be instructed to be more attuned to their dog's behavior for future attacks to identify earlier symptoms. Previous work has shown that educating patients about premonitory symptoms can lead to earlier identification of impending migraine that might support earlier and more effective migraine treatment. For example, when provided with a list of potential prodromal symptoms, 100 migraine patients found that most patients could prospectively endorse having at least one prodromal symptom during 24 hours before experiencing a migraine.[22] These data support that, if migraineurs become aware of potential warning events (e.g., prodromal symptoms or changing behavior of their companion dog), migraines might be more effectively predicted to permit early treatment.

Interpreting data from this study is limited through survey design. Although a substantial number of migraineurs participated in this survey, participants were individuals seeking migraine information through Internet resources rather than representing a typical general population sample. Unique features of this sample might have affected results. Women were overrepresented in the study population, as is typical of migraine studies (both surveys of migraineurs and clinical trials) in which women generally comprise >85–90% of the study population.[23–28] Furthermore, the diagnosis of migraine was not verified and could have included individuals with self-diagnosed or physician-diagnosed migraine. Although self-diagnosis has been used in a number of studies, lack of diagnostic confirmation limits the strength of conclusions that can be drawn from studies relying on self-diagnosis.[29] Self-diagnosis, however, was shown to be fairly reliable in the previously published evaluation of 1675 subjects in the Women's Health Study with self-reported migraine; detailed evaluation of headache episodes among these subjects confirmed a migraine diagnosis for 88% self-reporting migraines.[30] A study comparing self-diagnosis to physician assessment at the London Migraine Clinic likewise reported good agreement between physican and self-diagnosis, with many patients experiencing both migraine and nonmigraine headaches accurately identifying these different headaches.[31] Data from the current study should be duplicated in individuals with a migraine diagnosis confirmed through detailed history analysis and physical examination. In addition, it is possible that, in some cases, the owners have become more sensitive to their dogs during and as part of their migraine prodrome rather than an actual change occurring in the dog's behavior. Regardless of whether the change is in the dog's behavior or in the owner's perception, these observations by migraine sufferers provide important opportunities to identify migraine early and treat milder symptoms that are generally more amendable to currently available therapies. Although over half of participants endorsed that the change in the dog's behavior was often or usually linked with the subsequent development of a migraine, the retrospective nature of reporting in this study prohibited confirmation of consistency between the dog's behavior and migraine development. Correlations were not identified between owner demographics, migraine frequency, and dog breed and alerting behavior. Lack of identified correlations may have resulted from other important contributing factors that were not assessed, including dog training, the amount of time the owner spends with the dog, the likelihood of migraines occurring during time periods when the owner is typically around the dog, etc. Future studies are needed to prospectively evaluate the consistency between a dog's potentially alerting behavior and the development of a migraine attack.

Conclusions

Alerting behavior occurring in advance of migraine attack symptoms was reported by about one in four migraineurs living with a companion dog. Some individuals recognizing dog alerting behavior used this information to change their own behavior to include earlier migraine treatment.

Acknowledgment

Disclosure Statement

Dr. Marcus has no conflicts of interest. Ms. Bhowmick is an employee at Health Union, LLC, which owns Migraine.com. She has no additional conflicts of interest to report.

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Address correspondence to:
Dawn A. Marcus, MD
Pain Medicine
Centre Commons Building, Suite 400
5750 Centre Avenue
Pittsburgh, PA 15206

E-mail: marcusd@upmc.edu

EXHIBIT 1. REPRESENTATIVE SAMPLE
OF ALERTING DESCRIPTIONS

- This sporting dog began alerting its owner (female, <21 years old) to migraines between ages 6 and 12 months. One to 2 hours before migraine symptoms are first noticed, the dog usually begins barking, spinning in tight circles, and wagging its tail frantically. This is repeated about every 15 minutes until migraine symptoms first begin. At that point, the dog becomes quiet and stays glued to its owner's side with its head on the owner's lap. The owner notes that recognizing the dog's signals allows her to "get a head start on my pain control."
- This herding dog began alerting its owner (woman, 55–64 years old) when it was over 2 years old. This well-trained dog has earned multiple obedience and agility titles and is normally very responsive to the owner's command. Before a migraine, the dog stares at the owner and refuses to settle down or obey commands to sit or lie down. Migraine aura symptoms consistently begin within about 30 minutes of the dog's alerting behavior. Recognizing the link between the dog's behavior and an impending migraine, the owner now takes migraine treatment as soon as the dog's behavior is recognized. Once medications have been taken, the dog settles at the owner's feet and goes to sleep. The dog displays similar alerting behavior for two of the owner's coworkers who also experience migraines, with a shorter time between the dog's alert behavior and the onset of migraine symptoms for these individuals.
- This 3-year-old Labrador retriever–pit bull mix began alerting his owner (woman, 35–44 years old) after the dog was 2 years old. About 30 minutes prior to a migraine starting, the dog's behavior changes. He begins to whine and starts bumping into his owner "almost obsessively." He will try to direct the owner to lie or sit down and then sit on her and refuse to leave. She has also had experiences during the night when the dog has woken her during the night with incessant licking to one side of her head; this behavior has been followed by the development of a unilateral migraine. The owner now typically treats her migraine after the dog's behavior is recognized and before she begins to experience migraine symptoms.

APPENDIX. MIGRAINE AND DOGS SURVEY

Inclusion questions

1. Are you at least 18 years old? (must be yes to proceed)
2. Do you have migraines? (must be "yes" to proceed)
3. Do you or have you lived with a dog as an adult since you started getting migraines? (must be "yes" to proceed)

Demographic questions

1. Are male or female?
   ○ Male
   ○ Female
   ○ Other
2. What is your age?
   ○ 21 and Under
   ○ 22 to 34
   ○ 35 to 44
   ○ 45 to 54
   ○ 55 to 64
   ○ 65 and Over
3. How many migraines do you usually get in a month?
   ○ 0–3
   ○ 4–8
   ○ 9–14
   ○ 15–20
   ○ 21–25
   ○ More than 25

Dog alerting questions

1. What type of dog or dogs do you or have you lived with since you were an adult with migraines? (please check all that apply)
   ○ Sporting dogs (e.g., Spaniels, Retrievers, Pointers)
   ○ Hound
   ○ Terrier (e.g., terriers and pit bulls)
   ○ Working dog (e.g., Akita, Doberman, Great Dane, Husky, Mastiff, Newfoundland, Portuguese water dog, Rottweiler)
   ○ Toy dog (e.g., Chihuahua, Chinese crested, Pomeranian, Toy/Miniature Poodle, Pug)
   ○ Non-sporting (e.g., Bulldog, Dalmatian, Standard Poodle)
   ○ Herding (Cattle dog, Collies, Corgi, German Shepherd, Sheepdog)
   ○ Mixed breed
   ○ Other (describe)_____
2. Have you ever noticed that your dog pays closer attention to you before you get a migraine?
   ○ Yes
   ○ No
3. Have you noticed that your dog's behavior changes before your migraine begins or when you first start having symptoms during a migraine episode?
   ○ Yes
   ○ No
4. Does your dog ever act in an unusual way that you have learned to recognize as being a warning or signal to the start of a migraine episode?
   ○ Yes
   ○ No

[People answering yes to any of the dog alerting questions 2, 3, or 4 were asked to complete the following additional questions (5 through 12). For all others, the survey was concluded at this point.]

When your dog acts in a different way or behaves differently before your migraine, you may begin to recognize that behavior as a warning of an impending migraine. When that happens, we say that your dog is *alerting you* to your migraine. The remaining questions with ask about your dog's possible alerting behavior and the characteristics of the dog that has alerted you.

5. If your dog *starting living with you as a puppy*, how old was your dog when the alerting behavior began?
   ○ up to 6 months old
   ○ 6-12 months old

    ○ Between 1 and 2 years old
    ○ Over 2 years old
    ○ I got my dog when he or she was older than a puppy

6. If your dog *started living with you after the dog was over 1 year old*, how long did the dog live with you before you started noticing alerting behavior before your migraines?
    ○ 0- 6 months
    ○ 6-12 months
    ○ Between 1 and 2 years
    ○ Over 2 years
    ○ I got my dog when he or she was a puppy

7. What does your dog do to let you know a migraine is going to begin (choose as many as apply):
    ○ Stare at you
    ○ Bark at you
    ○ Sit on you
    ○ Refuse to leave your side
    ○ Whine
    ○ Paw at you
    ○ Other (describe)_____

8. Once your dog's alerting behavior starts, how long does it typically take before your migraine symptoms usually begin?
    ○ 0–15 minutes
    ○ 16–30 minutes
    ○ 31–60 minutes
    ○ Between 1–2 hours
    ○ Longer than 2 hours before a migraine
    ○ My migraine symptoms usually have started before I notice the dog's behavior

9. When do you begin your migraine treatment (such as medications) or techniques to reduce migraines (such as relaxation techniques or exercise) when you recognize your dog is alerting you to an impending migraine
    ○ As soon as the dog's behavior is recognized

    ○ Sometime between the dog's behavior and the first migraine symptoms
    ○ After my migraine symptoms have started
    ○ I have usually already started to treat my migraine before my dog's alerting behavior begins

10. How consistently is the dog's migraine behavior linked with you having a migraine?
    ○ Occasionally a migraine occurs when my dog's behavior occurs
    ○ Sometimes a migraine occurs when my dog's behavior occurs
    ○ Often a migraine occurs when my dog's behavior occurs
    ○ Usually a migraine occurs when my dog's behavior occurs
    ○ I always treat to abort a migraine when the dog's behavior occurs, so I don't know

11. What type of a dog or dogs have you had that alerted you to your migraine (choose all that apply)
    ○ Sporting dogs (e.g., Spaniels, Retrievers, Pointers)
    ○ Hound
    ○ Terrier (e.g., terriers and pit bulls)
    ○ Working dog (e.g., Akita, Doberman, Great Dane, Husky, Mastiff, Newfoundland, Portuguese water dog, Rottweiler)
    ○ Toy dog (e.g., Chihuahua, Chinese crested, Pomeranian, Toy/Miniature Poodle, Pug)
    ○ Non-sporting (e.g., Bulldog, Dalmatian, Standard Poodle)
    ○ Herding (Cattle dog, Collies, Corgi, German Shepherd, Sheepdog)
    ○ Mixed breed
    ○ Other (describe)_____

12. Please describe your dog's alerting behavior (open response).