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Flea and Tick Treatment Satisfaction and Preferences of Dog Owners in the United States, United Kingdom and Australia who have Treated their Dog with Fluralaner

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Abstract

Background: In a survey of US dog owners who had experience with giving fluralaner oral chews to their dog, overall satisfaction with fluralaner and preference for fluralaner compared to monthly flea and tick medications were high. These owners also believed that the required annual duration of flea and tick coverage is shorter than the duration recommended by their veterinarian. This paper compares these US results with results of two nearly identical studies involving veterinarians and dog owners in the UK and Australia.

Results: Veterinarians in 3 countries provided their flea and tick treatment duration recommendation for dogs. In addition, dog owners visiting the veterinarians' practices completed a multiple-choice survey on their flea and tick treatment experience. All dog owners had current experience with fluralaner purchased for their dog. A very high proportion (97% US, 97% UK, 100% AU) of veterinarians recommend 12 months of protection against fleas while in the UK and AU a lower proportion of veterinarians recommend 12 months of protection against ticks (96% US, 49% UK, 75% AU). All participating owners treated their dogs currently with fluralaner and most (73% US, 68% UK, 77% AU) had previously treated their dog with monthly flea and tick products. The convenience of 12-week dosing (67% US, 67% UK, 69% AU) and "dosing less often" (67% US, 48% UK, 51% AU) were their most important reasons in choosing an extended effect treatment. Dog owners indicated high satisfaction (satisfied or highly satisfied) with the extended duration flea and tick product (93-96%). Preference for a 12-week over monthly retreatment was very high and ranged from 82%-92% in all three countries.

Conclusion: Dog owners in the three countries expressed a high satisfaction and preference for extended 12-week flea and tick protection over monthly flea/tick products. Owners recognize the convenience of 12-week treatment intervals for improving compliance. Dog owners in three different countries have similar opinions regarding flea and tick treatment duration requirements.

Keywords: Fleas; Ticks; Dogs; Fluralaner (Bravecto®); Satisfaction; Preference; Convenience

Introduction

Fleas and ticks are common ectoparasites of animals that can cause disease by direct skin irritation and by transmitting pathogens or toxins while blood feeding [1-5]. Treatments are available to remove these parasites from cats and dogs and eliminate the juvenile life stages from homes and properties. In recent years, isoxazoline class ectoparasiticides have become available as an effective systemic treatment for fleas and ticks on cats and dogs [6]. Most ectoparasiticides for dogs and cats, including the isoxazolines, are dosed at a monthly retreatment interval; however, the novel isoxazoline fluralaner (Bravecto®, Merck & Co., Inc., Kenilworth, NJ, USA) is uniquely registered for administration to either dogs or cats with a 12-week retreatment interval in the US and UK or a retreatment of 3 months in Australia [7].

A prior study demonstrated that pet owner adherence to veterinary recommendations for canine flea and tick protection in the US is limited [8]. Another study showed on average, dog owners purchased approximately 5-6 months of flea and tick protection when using up to a 12-week retreatment interval treatment but purchased 1-2 months less when using a flea and tick treatment with a monthly interval [9]. Furthermore, the change up to a 12-week retreatment interval had no impact on dog owner adherence to heartworm prophylaxis because US owners purchased an average of just over 7 months of heartworm prophylaxis [10], regardless of the retreatment interval for concurrent flea and tick control. Overall satisfaction with and preference for a 12-week flea and tick medication compared to monthly medications was high [11]. An additional two studies were conducted to evaluate the responses of dog owners in the UK and Australia regarding their flea and tick treatment preferences and to compare the results across the three countries. This paper presents the results of this 3-country comparison.

Materials and Methods

The methodology for the study in the US [11] was the basis for an essentially identical protocol followed in the UK and Australia to obtain flea and tick control recommendations of veterinarians and to quantify the flea and tick treatment opinions of dog owners. The only differences between countries were slight variations in questionnaire wording as described below. At the time of the survey, all dog owners were giving fluralaner doses to their dogs.

At least 25 clinics in each country agreed to participate with at least one veterinarian in each clinic providing information about their flea and tick prophylaxis recommendation. These recommendations were recorded separately for fleas and ticks. Clinic staff selected for participation dog owners who would be in the clinic that day for a wellness appointment or some other reason (pick up dog supplies, ask a question, etc.) or who had completed a wellness visit in the past few days and could be contacted at home. Paper surveys would be completed in the waiting room or over the phone with the assistance of a clinic staff member.

Participating dog owners were selected based on their current experience administering oral fluralaner, and each owner was required to have administered at least one dose to their dog. Owners in the UK were excluded if they were part of an organized canine health care plan with a potential impact on adherence to treatment recommendations. Dog owners known to have a negative experience with any veterinary medication were not excluded.

Each participating dog owner completed a survey including provision of demographic details for the owner and dog along with prior experiences with observing fleas and ticks. Owners also completed a written survey with a series of questions to gain an in-depth assessment of their opinions on flea and tick treatment. The questions were designed to particularly focus on the owners' experiences with either the extended 12-week retreatment interval recommended for fluralaner compared with the monthly retreatment interval of many commonly used flea and tick treatments. Identical study methodologies were used in the three countries; however, the exact survey questionnaire wording was appropriately modified as necessary. These differences in wording among the different country surveys were minimal and were made to adapt to local phrasing or customary pet owner behavior for each country. For example, US owners recognize "dog park" as an outdoor place where dogs frequently mingle, while this term was not as commonly used in the UK at the time. Therefore, a US question referencing "dog parks" was substituted to reference "boarding kennel" for UK owners.

Another difference among the surveys relates to different parasite risks when assessing pet owner recall of the veterinary recommendation on flea and tick protection. In the US and UK owners were asked for a single amount of time (months per year) to protect against both fleas and ticks. However, in Australia, the Paralysis Tick (*Ixodes holocyclus*) represents a very serious health hazard in specific geographic areas, and owners were asked for a separate response on the recommended duration of protection against fleas or paralysis ticks.

Results

Veterinarians (26 US, 35 UK, 28 AU) from every participating clinic provided their recommended annual flea and tick control duration for dogs (Table 1). The average veterinarian had more than 12 years practice experience. Almost all surveyed veterinarians recommend 12 months of flea control per year in all three countries. The proportion of veterinarians recommending a full year of tick control was lower, with the largest proportion in the US (97%) and the smallest proportion in the UK (49%).

		United States	United Kingdom	Australia
Participating Veterinarians		26	35	28
Years in practice (Mean ± SD)		17.0 ± 11.5	12.0 ± 10.6	19.5 ± 11.5
Number of veterinarians with a particular flea or tick recommendation				
Fleas	12 months	25 (97%)	34 (97%)	28 (100%)
	Less than 12 months	1 (3%)	1 (3%)	0
Ticks	12 months	25 (97%)	17 (49%)	21 (75%)
	Less than 12 months	1 (3%)	18 (51%)	7 (25%)

Table 1: Clinical practice experience of veterinarians and their flea/tick control recommendations in three different countries.

Owners provided information on 1608 dogs (559 US, 537 UK, 512 AU) evenly divided between male and female in the three countries (Table 2). A large majority of the dogs were neutered, with an average body weight just under 20 kg and average age of 5-6 years. The daily time outside (4.2 hours US, 3.7 hours UK, 8.3 hours AU) was notably longer in Australia. Owners in the three countries had a very similar assessment of their dog's health as excellent (55-58%), good (35-39%), fair (5-6%) or poor (<1%). Most dogs in the three countries participated in outdoor activities associated with a potential risk for fleas or ticks. The most common reported activity was access to high grass (US) or socializing with other dogs (UK and AU).

	United States	United Kingdom	Australia

Number of owners	559	537	512
Dog gender			
Male	51.6%	50.1%	52.3%
Female	48.4%	49.5%	47.7%
Dog neuter status			
Neutered	88.8%	76.9%	90.8%
Intact	11.2%	23.1%	9.2%
Dog body weight (Mean ± SD) Kg	18.8 ± 14.2	19.3 ± 11.9	17.2 ± 11.9
Dog age (Mean ± SD) Years	6.1 ± 3.6	5.1 ± 3.6	5.3 ± 4.0
Mean hours outdoors per day (Mean ± SD)	4.2 ± 4.9	3.7 ± 2.7	8.3 ± 6.6
How healthy is your dog?			
Excellent	58.9%	54.7%	58.7%
Good	34.8%	39.3%	35.0%
Fair	6.0%	5.7%	5.9%
Poor	0.4%	0.2%	0.4%
List your dog's activities (Check all that apply)			
Dog park	32.5%	n/a	n/a
Swims	24.9%	43.4%	45.1%
Walks off leash	48.8%	82.5%	65.2%
Access to woods/bush/national parks	39.7%	81.4%	40.8%
Access to high or uncut grass	51.7%	80.1%	50.0%
Socializes with other dogs	n/a	90.5%	85.7%
Boarded in kennels	n/a	22.0%	31.3%

Table 2: Owner descriptions of their dogs in US, UK and Australia.

Over 1600 dog owners completed surveys and close to 70% were female in each country (Table 3). The most common age block for owners was 50-59 years in the US and Australia, but slightly younger at 40-49 in the UK although the differences in proportions were small in the blocks between 30-60 years. Owners averaged close to 5 years of experience as caretakers for their current dog. Owners with prior flea or tick experience reported seeing fleas or ticks on the dog more often than in the house or on the family. Experience with fleas was more common in the US and AU while more UK owners reported experience with ticks than with fleas. Ticks were much more commonly reported on the family than fleas were in all three countries, while fleas were more commonly seen in the house than ticks were. A few the owner's opinion reported experience with fleas and ticks in their bed, except in Australia where no owner reported experience with a tick in the bed. Approximately 25% of owners could not recall their veterinarian's recommendation on flea and tick control, and this was quite similar in the three countries. The owners who could recall this recommendation underestimated the duration, based on 12 months of flea protection, by more than 1 month (1.2 months less in the US, 3.4 months less in the UK, 1.3 months less in AU). The owners opinion was that protection is needed for most of the year (10.5 months US, 9.3 months UK, 10.6 months AU) and was typically shorter than the duration recommended by veterinarians.

	United States	**United Kingdom**	**Australia**
Number of owners	559	537	512
Owner gender			

Male	25.00%	24.00%	25.20%	
Female	69.80%	72.40%	72.50%	
Prefers not to state	5.20%	3.50%	2.30%	
Owner Age Range				
Oct-19	0.20%	0.20%	0.80%	
20-29	8.40%	9.50%	17.40%	
30-39	14.10%	16.20%	20.70%	
40-49	18.80%	22.20%	19.50%	
50-59	23.60%	21.40%	21.50%	
60-69	16.30%	14.70%	10.70%	
70-79	6.60%	6.30%	3.30%	
80-89	0.70%	0.20%	1.60%	
Prefers not to state	11.30%	9.30%	4.50%	
Mean years as primary caregiver for this dog	5.39	4.50	4.72	
Have you ever seen fleas ?				
On this dog	41.10%	24.40%	48.60%	
In your house	11.80%	11.70%	18.80%	
In your bed(s)	3.20%	2.40%	2.70%	
On your family	2.70%	3.70%	2.70%	
On other pets	n/a	n/a	16.20%	
Have you ever seen ticks?				
On this dog	31.30%	34.80%	18.00%	
In your house	5.70%	5.40%	2.00%	
In your bed(s)	2.30%	0.60%	0	
On your family	10.70%	6.30%	9.00%	
On other pets	n/a	n/a	7.20%	
Mean recalled duration of veterinarian's flea and tick protection recommendation (months / year)	10.8	8.6	10.7 (fleas)	9.6 (paralysis tick)
Number of pet owners with no idea	25.40%	22.00%	28.70%	35.40%
Mean owner recommended flea and tick protection duration (months / year)	10.5	9.3	10.6 (fleas)	9.6 (paralysis tick)

Table 3: Dog owner demographics and reported ectoparasite observation experience in US, UK and Australia.

The dog owner survey contained ten multiple choice questions. The distribution of answers by country is shown in Table 4.

	United States	**United Kingdom**	**Australia**
Dates of survey	Mar-May, 2016	Aug-Oct, 2016	Jan-Mar, 2017
Q. 1. Previous use on dog of flea/tick products other than a 12-week duration treatment			

Yes	72.6%	68.0%	76.6%
No	19.3%	29.2%	18.9%
Don't know	7.0%	2.8%	3.9%
No response	1.1%	0	0.6%
Q. 2. Level of satisfaction with current treatment			
Very Satisfied	64.6%	70.6%	60.5%
Satisfied	28.8%	25.9%	33.8%
Neither satisfied nor unsatisfied	3.4%	2.0%	3.1%
Unsatisfied	0.5%	0.6%	0.8%
Very Unsatisfied	0.0%	0.4%	0.8%
No response	2.7%	0.6%	1.0%
Q. 3. Aspects of current treatment that are important			
Convenience	72.5%	73.0%	69.1%
12-week dosing	66.7%	67.2%	78.1%
Dosing less often	66.5%	48.2%	51.0%
How quickly it kills fleas and ticks	45.3%	50.8%	43.4%
Easier dosing puts less stress on me	44.9%	39.9%	40.2%
Palatability	42.9%	51.2%	52.9%
Other (free text)	6.1%	6.5%	6.3%
Q. 4. Most important reason for current treatment choice			
12-week dosing	25.0%	25.9%	41.0%
Convenience	20.2%	21.6%	16.7%
Dosing less often	19.4%	11.1%	10.7%
How quickly it kills fleas and ticks	18.3%	23.7%	19.7%
Easier dosing puts less stress on me	9.3%	5.1%	4.3%
Palatability	4.8%	8.1%	3.2%
Other (free text)	3.0%	4.5%	4.5%
Q. 5. Why current 12-week duration treatment is preferred over previous monthly treatment			
Dog is less likely to get fleas	54.0%	55.7%	45.3%
I am less likely to forget a dose	51.5%	48.6%	54.1%
I can give flea/tick protection less often	47.0%	38.2%	49.8%
Dog is less likely to get ticks	43.6%	49.9%	42.4%
Dog is less likely to bring fleas/ticks into the house.	41.1%	34.3%	26.2%
Dog is more likely to be protected when it matters most.	34.5%	38.9%	38.9%
Dog is less likely to itch	30.2%	27.0%	29.3%
Other (free text)	4.1%	3.2%	5.5%

Q. 6. Is there a delay beyond the recommended 12 weeks in giving the next dose ?			
Mostly on time	74.7%	70.4%	73.2%
Delayed by a few days	16.9%	20.8%	19.8%
Delayed by weeks	6.1%	6.4%	4.4%
Delayed by months	2.2%	2.4%	2.6%
Q. 7. More likely to give a 12-week retreatment on time compared to a monthly retreatment			
Yes	64.7%	73.6%	63.2%
No	3.4%	3.6%	2.8%
About the same	25.8%	20.8%	25.7%
I don't know	6.1%	2.1%	8.3%
Q. 8. Comparison of the duration of protection the dog receives with a 12-week duration treatment			
Fewer months	9.1%	4.3%	5.2%
Same number of months	55.3%	50.5%	56.0%
More months	35.6%	45.3%	38.9%
Q. 9. 12-week retreatment interval compared with a monthly retreatment interval			
More convenient	88.2%	87.8%	87.5%
Same convenience	10.7%	12.2%	11.5%
Less convenient	1.1%	0	1.0%
Q. 10.Prefer fluralaner over other flea and tick products			
Yes	88.6%	91.7%	82.4%
No	1.1%	1.2%	3.8%
About the same	10.2%	7.1%	13.8%

Table 4: Dog owner flea and tick control opinions in US, UK and Australia.

Discussion

This study demonstrated that veterinarian and pet owner opinions regarding flea and tick control are very similar in the UK, US and Australia despite the differences in the commercial availability of treatment options and the differences in climate and disease risks. Fluralaner is available in the US and UK by prescription only but is an over-the-counter medication in Australia. Dog owners completing this survey in each country describe their experiences giving fluralaner chews to their dogs and rate their level of satisfaction (Q. 2, Table 4), perception of convenience (Q. 9) and preference for extended duration dosing relative to monthly dosing (Table 4). The measure of satisfaction (owners that were very satisfied plus satisfied) is very high in all countries (93% US, 96% UK, 94% AU). The measure of convenience (more convenient than monthly products) is uniformly high (88% US, 88% UK, 87% AU). The measure of preference for an extended duration flea/tick medication relative to monthly products is also quite high (89% US, 92% UK, 82% AU). Most participating dog owners thought that they were more likely to give the follow-up doses on time for fluralaner compared to monthly flea/tick products (65% US, 74% UK, 63% AU). A small proportion thought that monthly dosing resulted in more on-time administration compared to extended duration dosing (3% US, 4% UK, 3% AU).

The majority of veterinarians (87/89) surveyed in this study recommended 12 months of flea control per year for dogs (97% US, 97% UK, 100% AU). The proportion of veterinarians recommending 12 months of tick control was highest in the United States (25/26; 97%) and lower in Australia (21/28; 75%) and the UK (17/35; 49%). This may reflect the perceived threat of tick-borne disease in each country at the time of the study. The Paralysis Tick risk in Australia is seasonal and not evenly distributed across the country, and this may alter the perception of tick protection that is required in different regions.

The need for flea/tick medication for dogs was supported by the number of dog owners who had seen fleas on the dog (24-48%) and in the house (11-18%) as well as the number of dogs with exposure to local environments that support fleas/ticks and outside activities that bring them to these environments. The average dog owner thought that their dog needed less than 12 months of protection. Dog owners in this study were currently dosing their dogs with the oral fluralaner product and most (Q. 1: 68-77%, Table 4) had previously used monthly flea/tick products.

Pet owners recalled the duration of flea and tick protection as 1-2 fewer months than the duration reported by veterinarians in each country. Approximately 25% of dog owners had no recollection of what the veterinary recommendation might be, although all these owners had experience with administering flea/tick products. When dog owners were asked for their opinion regarding the number of months of flea/tick protection their dog needed each year, the estimates were similar to the number of months recalled for the veterinary recommendation. This study did not attempt to assess the dog owners actions in response to the veterinary recommendation (purchases of flea and tick medication) although other studies have looked at dog owner flea and tick medication purchases in the US [9] and Spain [12].

Many dog owners who participated in these studies had prior direct experience with fleas and ticks and approximately 75% had used other flea/tick medications before using fluralaner. Across the three countries, Australian owners reported the highest frequency of fleas on the dog (48%) and in the house (18%) before starting treatment while US /UK dog owners reported the highest frequencies of ticks on the dog (31-34%) and in the house (>5%). Outdoor activities contribute to the dog's flea and tick exposure. A large proportion of dog owners allowed their dog to go to a dog park (US 33%), walk off leash (49% US, 83% UK, 65% AU) and have access to high or uncut grass (52% US, 80% UK, 50% AU).

Survey responders reported that the longer dosing interval of fluralaner was more convenient than monthly dosing with other flea/tick products and was the primary benefit selected (Q. 3, Q. 4) across all three countries. When owners were given the option of choosing one benefit, more than one benefit or none of the choices provided (they could write in their own comment) (Q. 3), "Convenience" was the most frequent selection (69-73% of all dog owners) as a benefit of extended duration fluralaner. When asked to choose only one benefit of fluralaner as their current treatment choice (Q. 4), dog owners in all 3 countries selected "12-week dosing" as their top choice, followed by either "convenience" or "how quickly it kills fleas and ticks" or "less frequent dosing". Extended duration (12 week) dosing was the only benefit that could not be applied to a monthly flea/tick product and seemed to be very important to dog owners who have tried fluralaner. The second, third and fourth choices again reflect the convenience associated with extended duration (less frequent) dosing as well as the efficacy reflected in speed of kill. Overall, these responses indicate that extended dosing duration is a principal benefit of fluralaner use and is associated with improved convenience.

There is a clear regional difference to the question asking why 12-week duration flea/tick treatment might be preferred over monthly flea/tick treatments (Q. 5). Responses could choose one of the defined options or free choice text. The most frequently chosen response in the US and UK was "dog is less likely to get fleas", indicating a focus on optimal flea infestation prevention and improved efficacy. However, Australian owners most frequently chose "I am less likely to forget a dose", suggesting that continuous protection was more important. One value of extended duration dosing is that the number of re-administrations is reduced compared with monthly re-dosing. Consequently, there are fewer opportunities to forget or delay a dose when more months of protection are delivered in each dose.

The introduction of extended orally or topically administered flea and tick treatment raised questions about the propensity of dog owners to adapt to a longer 12-week re-treatment interval. Owners were asked (Q. 6, Table 4) whether they experience a delay in redosing fluralaner chews on a 12-week schedule which would suggest difficulty adapting to this new dosing program. Over the three countries, 70 – 75% of dog owners indicated that they dose the follow-up dose "mostly on time". Another 17-21% said that the next dose was delayed "by a few days". Taken together, 87-96% of dog owners indicated that they were able to provide fluralaner doses approximately on time. Dog owner self-reported estimates of canine medication dosing may exhibit an upward on-time dosing bias to avoid the appearance of neglect, although the extent of this bias was not assessed in this study.

The owners were asked to assess their ability to administer at the correct time an extended duration 12-week flea/tick doses relative to a monthly flea/tick doses (Q.7, Table 4). The objective was to evaluate whether 12-week dosing was more error prone than monthly dosing, in the owner's opinion. A large proportion of owners (65% US, 74% UK, 63% AU) indicated that they were more likely to dose a 12-week treatment on time compared with a monthly flea/tick product, suggesting that a longer dosing interval could be less error prone and more expeditious. A smaller proportion of dog owners (26% US, 21% UK, 26% AU) found no difference between extended duration fluralaner and monthly products. Only 2-3% of responding dog owners thought that monthly medications were more likely to be given on time than an extended duration flea/tick product.

Improvement in the on-time administration of flea/tick medication doses is consistent with increased compliance to veterinary treatment recommendations and is expected to lead to a reduced ectoparasite risk compared with an untreated or under treated dog that has missed doses. The benefits of a longer medication period identified in these studies ("12-week dosing", "convenience" and "dosing less often") were associated in previous studies in Spain and the US with the owner purchasing more months of coverage per year for dogs receiving fluralaner compared to monthly flea/tick products [9,12]. In Spain, dog owners acquired 48% more months of coverage per year with fluralaner than with one of 19 monthly topical products, or 34% more months per year compared with three monthly oral products [12]. In the US, dog owners who purchased fluralaner acquired 24-73% more months of coverage per year when compared to two specific oral monthly flea/tick medications [9]. In both studies, dog owners who chose fluralaner were significantly less likely to purchase 1-6 months and significantly more likely to purchase 7-12 months of flea and tick medication, leading to increased compliance with veterinary recommendations.

Conclusion

Veterinarians interviewed in three different and geographically distant countries recommend flea protection for the full year and tick protection for 12 months or less, with variation by country. Dog owners commonly underestimate or did not recall the veterinary recommendation. Dog owners in the three countries expressed a high satisfaction and preference for extended 12-week flea and tick protection over monthly flea/tick products. Owners recognize the convenience of 12-week treatment intervals associated with fluralaner for improving compliance.

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