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Research Article

Knowledge, Attitude and Practices on Rabies and Socio-Economic Value of Dog Keeping in Kisumu and Siaya counties, Kenya

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ABSTRACT

Rabies is endemic in all counties of Kenya. This study describes community knowledge, attitudes and practices that may influence the incidence and control of the disease. Semi-structured questionnaires and focus group discussions were used in the study. A total of 351 residents were interviewed. Majority of owned dogs were free to roam and scavenge. Over 90% of the respondents were aware of the disease, its zoonotic nature and the importance of the domestic dog in its transmission. Although over 75% of respondents in both counties would seek conventional medical treatment after an animal bite, 16.6% of respondents in Kisumu considered traditional treatment as their first line of action after an animal bite. Most of the respondents were not aware of any home level action after an animal bite. Rabies awareness was high in both counties but only 20.4% and 19.1% of the households in Kisumu and Siaya respectively had vaccinated their dogs. Children and women played a major role in rabies prevention and control. Schools proved to be the most common source of information. The knowledge gaps and negative practices identified by this study show the need for public awareness and sensitization on rabies. This will impart positive attitude on the best practices towards control of the disease.

Key words: Kisumu, Siaya, Kenya, rabies, dog

INTRODUCTION

Rabies is a neglected viral zoonotic disease that is almost invariably fatal in humans and other mammals. It mainly affects the low and middle income countries. Domestic dogs are the main vectors of the disease causing 94% of human rabies through bites (Abbas *et al*., 2011). The prevalence of the disease is highly influenced by the density of unvaccinated dog populations (Appel and Carmichael, 1979). In addition to the mortalities and Disability Adjusted Life Years (DALYs), the public health burden of rabies extends to the cost of disease control. The fear of the disease and uncertainty of outcome cause psychological trauma on the victims of animal bites (Cleaveland *et al*., 2001).

Reliable data on rabies are necessary to understand the epidemiology of the disease, its impact on human and animal populations, and to obtain commitment and support from national authorities in the implementation of preventive and control programs (Balogh *et al*., 2001). Such information is always lacking, especially in low-income countries and this has led to low prioritization of the disease leading to neglect (Kitala *et al*., 2000; Cleaveland *et al*., 2014).

In Kenya, rabies is neglected with only periodic vaccinations when outbreaks occur. There is scant knowledge on its drivers in Kisumu and Siaya counties which continue to report high incidences of animal bites and human rabies. This study was developed to establish community knowledge, attitudes and practices that may influence the incidence and control of the disease. In addition, the study aimed at evaluating the socio-cultural and economic value of dog keeping, and the roles played by children and women in rabies prevention and control in Kisumu and Siaya counties.

MATERIALS AND METHODS

The study was carried out in Kisumu and Siaya counties in Kenya. Study areas were purposively selected based on their reported high numbers of animal rabies cases and dog bites. Kisumu Central and Seme sub-counties were selected in Kisumu County while Gem and Alego sub-counties were selected in Siaya County.

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Households were randomly selected using a road transect and every third home was included in the study.

Participatory focus group discussions (FGDs) and questionnaires were used to generate information on the level of the community knowledge, attitude and practice on rabies incidence and human exposure in the study areas. Door to door interviews were conducted and questions were asked to household heads or other household members above the age of 15 years in the absence of the household head. At least 138 respondents from each county were required for the study, calculated based on the proportion of knowledge on rabies reported in a previous study (Mucheru *et al.*, 2014) and computed using the formula for estimation of proportions and means (Dohoo *et al.*, 2009) at 95% confidence level and 5% precision as described by Zafar *et al.* (2014). FGDs were done with selected potential key informants who included women group leaders, village elders/ chiefs, public health officers and field veterinary officers.

RESULTS

Household characteristics

A total of 183 and 168 residents were interviewed in Kisumu and Siaya Counties respectively. In both Kisumu and Siaya, the number of male and female respondents was proportional. Most of the respondents were above 40 years of age and had achieved primary and secondary education levels. The average number of people per household was 5.8 in Kisumu and 6.4 in Siaya. The mean number of people per household was significantly higher in Siaya than in Kisumu (P= 0.0285).

Type of homestead fencing

Only 7.1% and 14.9% of the homesteads in Kisumu and Siaya respectively had a full fence capable of restraining dogs in the compound. The rest of the homesteads had either an incomplete fence or no fence at all. A significantly higher proportion of households in Kisumu than in Siaya (P= 0.0002) did not have a fence.

Existence of dogs in households

In Kisumu and Siaya, 61.8% and 71.4% of the respondents interviewed had at least one dog respectively. A total of 259 and 299 owned dogs were counted in Kisumu and Siaya respectively

Dog confinement

In Siaya, 65.55% of the respondents indicated that they restricted movement of their dogs while in Kisumu 68.57% said they don't (Fig.1). A significantly (P<0.001) higher proportion of owned dogs in Kisumu were free to roam than that in Siaya.

Types of dog feeds

In both counties, most of the households (63% in Kisumu and 85% in Siaya) fed their dogs on kitchen leftovers (Fig. 2). However, the proportion of owned dogs that depended on scavenging in Kisumu (36.28%) was significantly higher (P<0.001) than that in Siaya (13.56%).

Value attached to dogs

Other animals kept in the study areas included cattle, sheep, goats, cats and chicken. Qualitatively, a higher socio-economic value was attached to livestock than to dogs. This was evidenced by the little care given to dogs than to livestock in terms of provision for housing, food and veterinary care. Most of the respondents considered dogs a responsibility of young boys, unlike livestock that was owned by the head of the household. Cats and chicken were the least valued.

Rabies awareness

Over 90% of the respondents in the study areas had at least heard about the disease. Above 96% said that dogs are the primarily affected animals. However, about 58% of the respondents in both counties could not describe features of a rabid dog. Of the respondents involved in this study, 89% in Kisumu and 74% in Siaya were familiar about the importance of free roaming dogs in rabies transmission. Only 13.2% of respondents in Kisumu and 19.0% in Siaya were aware that rabies could affect livestock.

Zoonotic importance of rabies

Over 90% of the respondents in both counties were aware that rabies is zoonotic. In Kisumu and Siaya, 89% and 95% of the respondents respectively said that people get the disease through bites of infected animals.

Source of information on rabies

In both counties, school/friends/neighbors were the major sources of information (Fig. 3). There was a significant level of association between acquisition of formal education and knowledge about rabies (p= 0.010).

Dog/animal bite management

In Kisumu and Siaya, majority of respondents (52.6% and 32.5% respectively) were not aware of any home level action to take in case an animal or a person were bitten by a suspected rabid animal. Only 8.6% and 26.4% of the respondents in Kisumu and Siaya, respectively, would wash bite wounds with soap and water. Although over 75% of respondents in both counties would seek conventional medical treatment after an animal bite, a number of people in Kisumu (16.6%) considered traditional treatment as their first line of action after an animal bite (Table 1). A proportion of respondents in Kisumu (11.5%) and Siaya (15.2%) had at least one household member bitten by a dog in the previous 12 months.

Prevention of rabies

In Kisumu and Siaya, 78.6% and 66.9% respectively were aware of the importance of dog vaccination in prevention of rabies. However, only 20.4% and 19.1% of the respondents with dogs in Kisumu and Siaya respectively had vaccinated their dogs as proved by vaccination records respectively. Children were charged with the responsibility of taking dogs to vaccination points.

Of the respondents in Kisumu and Siaya, 71.0% and 78.0% respectively suggested eradication of free roaming dogs as a method of preventing rabies while 16.9% and 27.6% respectively had no idea of any prevention strategy. Most of the respondents (64%) in both counties would kill any animal they suspected of having rabies and only 21% of them would call a veterinarian for further action.

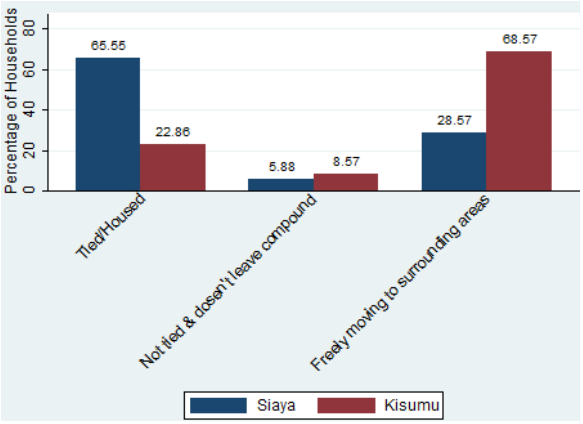

Fig. 1: Level of dog confinement in Kisumu and Siaya

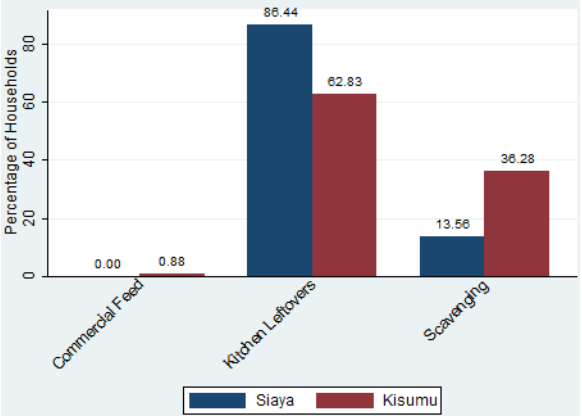

Fig. 2: Types of feed sources for owned dogs in Kisumu and Siaya

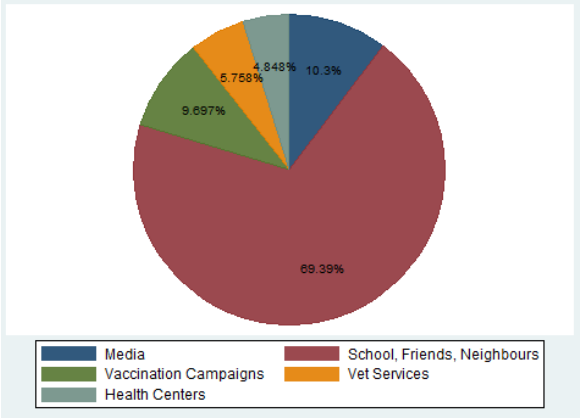

Fig. 0: Different sources of information on rabies in Kisumu and Siaya

Table 1: Bite wound management

	Kisumu	Siaya
Bite wound management	%	%
Wound wash with water	5.1	5.5
Wound wash with water and soap	8.6	26.4
Apply Alcohol	16.6	27.0
Apply irritants like lemon	0.6	6.8
Traditional treatment	16.6	1.8
No idea	52.6	32.5

DISCUSSION

The knowledge, attitude and practices (KAPs) analysis in this study was aimed at generating information to identify knowledge gaps, behavioral patterns and cultural practices hindering rabies control and exacerbating disease burden in Kisumu and Siaya counties. This information will act as baseline data for planning, implementation and evaluation of public awareness and rabies control programs. KAPs studies have been used widely to increase community knowledge and change attitude and improve practices that aid in disease prevention and control (Sambo *et al.*, 2014; Tiembré *et al.*, 2014; Balogh *et al.*, 2001).

Majority of respondents in this study (over 67%) had achieved primary and secondary school education. This is a positive attribute towards rabies control in the area of study as it has been demonstrated in this study that acquisition of formal education is associated with knowledge of the disease.

This study found that majority of the households (61.8% in Kisumu and 71.4% in Siaya) had at least one dog with an average of 2.3 and 2.5 dogs per household respectively. Similar findings were reported in a study in Abidjan, Côte d'Ivoire which had 71.7% of households with at least one dog (Tiembré *et al*., 2014).

Household dogs in Kisumu and Siaya counties mainly depend on kitchen leftovers and scavenging for their meals, which is similar to the observation reported in Makueni County (Zdu, 2014). However, more dogs in Kisumu scavenged for food than those in Siaya. This could be associated with the fact that a large proportion of households in Kisumu did not have a fence capable of restraining dogs in the compound and also fewer owners in this county restricted movement of their dogs compared to Siaya County. In this study, most of the households were partially fenced or had no fence at all. Only a small proportion had a fence capable of restraining dogs from roaming out of the homestead. This proportion was higher in Siaya than in Kisumu. Thus, a bigger proportion of owned dogs in Kisumu were free to roam than in that in Siaya. The kind of dog ownership in Kisumu and Siaya is one that would be referred to as "loose ownership" whereby there is irregular feeding and minimal physical restraint of the dog (ICAM-coalition, 2007), presenting a big challenge to rabies control efforts as has been observed in rabies-endemic regions/ countries; 79% of the households in Makueni (Zdu, 2014), 81% in Machakos (Kitala *et al.*, 1993) and 79% in Madagascar (Ratsitorahina *et al.*, 2009) where dogs were allowed to roam freely scavenging for food. Therefore, the roaming dogs in these areas are not "true strays" but owned dogs that are free to roam and scavenge. Confinement of dogs is thus not adhered to and this is a big challenge to rabies control efforts. Moreover, the socio-economic value attached to dogs in these areas is lower than that attached to other domestic animals. In comparison with livestock, most people do not consider dogs important domestic animals and thus do not take care of them. The low socio-economic value attached to dogs in these areas is a big challenge to both the welfare of the animals as well as the rabies control efforts. This is because people did not take care of the dogs in terms of providing regular feeding and

veterinary care when necessary. Due to lack of care, the dogs ended up staying away from homes and suffering from injury through traffic accidents, fighting, abusive treatment by the local people, cruel methods of catching and inhumane methods of killing such as strychnine poisoning, electrocution and drowning (ICAM-coalition, 2007). The roaming dogs are also highly vulnerable to various diseases such as rabies and other zoonotic diseases, skin conditions, wounds and malnutrition as these conditions were commonly seen in this population in the study areas. Furthermore, the increasing roaming dog population is not available for vaccination and presents a higher risk of contracting and spreading rabies.

In both counties, respondents had good knowledge about rabies, main species affected, its zoonotic importance and transmission methods. However, very few people knew that rabies could infect livestock. This is a big risk for human exposure by the unsuspecting livestock owners.

In this study, Schools, friends and neighbors have been shown to play an important role in dissemination of information about rabies compared to media, veterinary services and health centers. This is comparable to a study done in Abidjan where 82.19% of the people interviewed knew about rabies and school was the source of information for 88.6% of them (Tiembré *et al*., 2014). This makes schools an important target of any public education programs on rabies. The veterinary and medical services did not serve as an important source of information about rabies as only a small proportion of respondents said they learnt about the disease from these two departments. This calls for these departments to be more aggressive in public education about rabies.

More than half of the respondents in this study were not aware of any presenting feature of a rabid animal. This poses risk of human exposure as owners may try to help their sick animals. Any successful rabies control program must educate the public on the most common presenting features of rabies in animals. This will help people to avoid contact with such animals and thus reduce human exposure.

For those who suspected rabies, a big proportion would kill the animal and only a few of them would call a veterinarian for further action. This is a negative practice that must be campaigned against as it is recommended that suspect animals that have contact with humans but are not showing signs of disease not be euthanized immediately but isolated and observed for development of clinical rabies to aid diagnosis (Radostits *et al.*, 1994). Moreover, killing suspect animals without diagnosis many cases of rabies go unreported and thus the true situation of rabies is greatly under-reported in official records as has been noted by various authors (Cleaveland *et al.*, 2001, Zdu, 2014). Therefore, the local communities should be educated on the need to call veterinarians to collect such animals for isolation, observation, diagnosis, and if killed, to ensure a laboratory diagnosis is undertaken.

Though 66% of the respondents in both counties were aware that vaccination of dogs prevents rabies, and the veterinary department offers this service for free at least twice a year, only 20% had vaccinated their dogs against rabies. This finding is comparable to the 23% reported in Makueni (Zdu, 2014). Kitala *et al.* (1993) reported less than 33% of dogs in Machakos were vaccinated against rabies. These figures are far below the recommended 70% coverage for rabies control. It is therefore true to say that the knowledge is there but the practice is not adhered to. Again, as noted earlier, this may be attributed to the low socio- economic value attached to dogs in these counties. Very few respondents knew that confining dogs was equally important in rabies prevention. Lack of these pieces of information mentioned above coupled with the high numbers of homesteads without fencing or dog-confining facilities may be important drivers associated with the high numbers of roaming dogs and animal bites in the study areas.

Though, washing bite wounds with water and soap immediately after a bite minimizes the risk of developing rabies in animals and humans 52.57% and 32.52% of the respondents in Kisumu and Siaya respectively were not aware of any home level first line of action. Moreover, a significant proportion of respondents in Kisumu County considered traditional treatment as their first line of action after an animal bite and only a small proportion of the respondents in both counties would wash bite wounds with soap and water immediately after a bite. In Abidjan, 96.18% of people interviewed did not know that the wound should be washed with soap and water immediately after exposure (Tiembré *et al*., 2014). This indicates that this knowledge is not common in most rabies-endemic countries and hence there is an urgent need to educate the people on this basic preventive measure that can assist in saving lives. Since women are the ones usually actively involved in taking care of the bite victims, especially their children, they should be educated on the first line of action after a dog bite at home level, and the need for taking the victim to hospital for PEP (Balogh *et al*., 2001).

In this study, majority of respondents would take an animal bite victim to hospital to get conventional post-exposure prophylaxis (PEP). The key opinion leaders indicated that knowledge of rabies is increasing among the communities. More and more victims of dog bites are now seeking conventional medical help with very few seeking help from traditional healers compared to the past years. However, some of the victims end up not receiving the necessary treatment due to unavailability of the vaccine, its high cost or long distance travelled to acquire it. This makes the victims hopeless and resign to fate. Similar findings were reported by Kagira and Kanyari (2012) in Kisumu. This is a negative step towards rabies control and must be addressed with utmost urgency.

Conclusion

The knowledge gaps and negative practices identified by this study show the need for public awareness and sensitization on rabies. This will impart positive attitude on the best practices towards control of the disease. Children in schools and women groups are vital information dissemination targets as these groups have been identified as key participants of rabies control efforts by this study.

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