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The Changing Rate of Suspected Rabies Bites after Begin to Act Animal Shelter in Erzurum City

Erzurum İlinde Hayvan Bakımevinin Faaliyete Başlamasından Sonra Şüpheli Kuduz Isırık Oranının Değişimi

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Abstract

Objective: We aimed to evaluate the relationship between establishing an animal shelter in Erzurum and the number of suspected rabies bites between the years 2005 and 2012.

Materials and Methods: A retrospective, repeated cross-sectional study was planned in Erzurum in the year 2013. Records between the years 2005 and 2012 were obtained from the Communicable Diseases Department of the Erzurum Health Directorate. Data for 5789 cases exposed to suspected rabies bites were analyzed.

Results: 5789 suspected rabies bites were encountered in Erzurum between the years 2005 and 2012. After establishing the animal shelter in 2009, 4239 dogs were collected from the streets within four years and 426 of them were released after immunization. Additionally, the following services were given in the animal shelter between 2009 and 2012: immunization of 2935 dogs, sterilization of 1735 dogs, and release of 2082 dogs back to the street. 4-years before the establishment of the animal shelter, the number of dog-bites had decreased from 3403 cases to 2386 cases; 4-years after the establishment of the shelter, it declined by 29.8%. While there were 1096 suspected rabies cases during the year 2008, this ratio decreased by 40.9% after the establishment of the animal shelter in the year 2009. During the year 2010, where we had the highest number of homeless dog collection to the animal shelter, the decrease in suspected rabies bites reached the maximum decrease, namely 51.0%. Spearman correlation analysis showed a strong negative correlation between the number of collected animals and suspected rabies bites (r = -0,862; p=0.006).

Conclusion: Suspected rabies cases are common in Turkey and some cases of rabies are encountered. The number of suspected rabies bites in Erzurum has decreased significantly after establishing the animal shelter. It is an evident that establishing rehabilitation centers for homeless animals in all cities will have an important role in controlling zoonotic diseases including rabies.

Key Words: Rabies, street animal shelter, immunization

Özet

Amaç: Bu araştırmada Erzurum ilinde 2005 ile 2012 yılları arasındaki kuduz şüpheli ısırık vaka sayılarının ve Sokak Hayvanları Bakımevinin faaliyete geçmesi ile ilişkisinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Bu çalışma Ocak 2013 ile Mart 2013 tarihleri arasında Erzurum'da retrospektif tekrarlayan kesitsel bir araştırma olarak yapıldı. Erzurum ilinde 2005 ile 2012 yılları arasındaki kuduz şüpheli ısırık vaka sayıları ve aşılanma durumları İl Sağlık Müdürlüğü Bulaşıcı Hastalıklar Şube Müdürlüğü'nün kayıtlarından elde edildi. Şüpheli ısırığa maruz kalan toplam 5789 vakanın verileri değerlendirildi.

Bulgular: Erzurum ilinde 2005 ile 2012 yılları arasında sağlık kuruluşlarına toplam 5789 kuduz şüpheli ısırık vakası başvurmuştur. Bakımevinin faaliyete geçtiği 2009 itibaren 4 yıllık süre içerisinde 4239 sokak köpeği toplatılmış, bunların 426'sı aşılandıktan sonra salıverilmiştir. Ayrıca bakımevinde 2009 ile 2012 yılları arasında 2935 köpek aşılanmış, 1735 köpek kısırlaştırılmış ve 2082 köpek sokağa bırakılmıştır. Sokak Hayvanları Bakımevi (SHB) faaliyete geçmeden önceki 4 yıl boyunca 3403 olan ısırık sayısı sonraki 4 yılda %29,8'lik bir azalma ile 2386'ya gerilemiştir. SHB'nin bulunmadığı 2008 yılında 1096 kuduz şüpheli ısırık meydana gelirken, SHB'nin faaliyete geçtiği yıl olan 2009 yılında ısırık sayısı %40,9 oranında azalmıştır. SHB tarafından en fazla sayıda başıboş köpek toplanıldığı yıl olan 2010'da ise, kuduz şüpheli ısırık sayısı %51,0'lik bir oran ile en fazla sayıda düşmüştür. Spearman korelasyon analizinde toplatılan hayvan sayısı ile ısırık sayısı arasında kuvvetli bir negatif korelasyon olduğu görüldü (r =-0,862; p=0,006).

Sonuç: Türkiye'de kuduz şüpheli ısırıklar yaygındır ve kuduz olguları görülmektedir. Erzurum ilinde SHB'nin kurulması ile birlikte kuduz şüpheli ısırık vakaları dikkate değer bir oranda azalmıştır. Sokak hayvanları rehabilitasyon merkezlerinin tüm illerde kurulması kuduz başta olmak üzere zoonotik hastalıkların kontrolünde etkin bir role sahip olduğu ortaya çıkmaktadır.

Anahtar Kelimeler: Kuduz, sokak hayvanları bakımevi, aşı

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Introduction

Rabies is a preventable zoonotic disease caused by a Lyssavirus from the Rhabdoviridea family [1, 2]. It spreads to human via domestic or wild animals. Rabies has the highest case-fatality rate among infectious diseases. Although the rabies vaccine was developed in 1885, still yearly 30 000 – 70 000 people die because of this disease according to the WHO data [3]. Most of the death cases are because of insufficient control of the disease among domestic animals.

Rabies is rare in the United States with approximately 20 000 – 40 000 suspected rabies bites per year [4]. In Europe on the other hand, two cases of rabies were encountered in the year 2010, both of them after cat bites [5].

Turkey's being the only country in Europe with rabies cases makes it more important for us to fight against this disease [6, 7]. Although mortality from rabies has relatively decreased in Turkey after the recent precautions, sources are still present, especially in urban areas. Sources of the infection are regarded as dogs and wild animals. There are rabies diagnostic laboratories in nine cities of Turkey [6].

Mortality from rabies has decreased in Turkey over time. Although there were 52 mortalities due to rabies only in 1974, there are total 243 reported cases between the years 1980 and 2002 [7, 8]. With the recent health transition program applied in Turkey, cases of rabies have decreased substantially together with many other infectious diseases; only nine cases have been reported between 2003 and 2013 [9].

The animal shelter for Erzurum has been established on January 2009. Among others this center is carrying out duties such as collection of animals from the street, immunizations and sterilization procedures. This study aims to evaluate the relationship between the suspected cases of rabies bites in Erzurum and the operation of the animal shelter.

Materials and Methods

This study was designed as a retrospective repeated case-control study in Erzurum between January and March 2013. Records for cases and immunization status for suspected rabies bites between the years 2005 and 2012 were obtained from the Communicable Diseases Department of the Erzurum Health Directorate. Data for 5789 cases exposed to suspected rabies bites were analyzed.

Statistical analysis

Data was entered into computer and analyzed using the SPSS 20.0 software. Descriptive statistics and Spearman correlation analysis were performed. Significance level p was set as <0.05.

Results

Total 5789 suspected rabies bites applied to the health institutes in Erzurum from 2005 to 2012. The number of cases throughout the years is shown in Figure 1.

After the implementation of the animal shelter in 2009, 4239 street dogs were collected, out of which 426 were released after appropriate immunization. Additionally 2935 dogs were immunized, 1735 dogs were sterilized, and 2082 dogs were released from the animal shelter between 2009 and 2012 (Table 1).

During these four years before the animal shelter was established, the number of bites decreased from 3403 cases to 2386 cases, four years thereafter this number decreased by 29.8%. While there were 1096 suspected rabies cases during the year 2008, this ratio decreased by 40.9% after the establishment of the animal shelter in the year 2009 (Figure 1). During the year 2010, where we had the highest number of homeless dog collection to the animal shelter, the decrease in suspected rabies bites reached the maximum decrease, namely 51.0%.

Spearman correlation analysis showed a strong negative correlation between the number of collected animals and suspected rabies bites ($r=-0.862$; $p=0.006$).

Vaccines applied for bite cases were analyzed. Number of vaccines applied to bitten persons according to years is shown in Table 2.

The 2+1+1 vaccination scheme was applied in less and relatively sustained numbers. While the three-dose vaccination decreased within years, the five-dose vaccination scheme shows an increase over time (Figure 2).

Table 1. Distribution of the animal shelter activities according to years

	Number of rehabilitated animals					
Year	Collected	Owned	Sterilized	Immunized	Released	Total
2009	1177	151	227	557	557	2669
2010	1276	88	500	800	683	3347
2011	943	84	504	716	401	2648
2012	843	103	504	862	441	2753
Total	4239	426	1735	2935	2082	11417

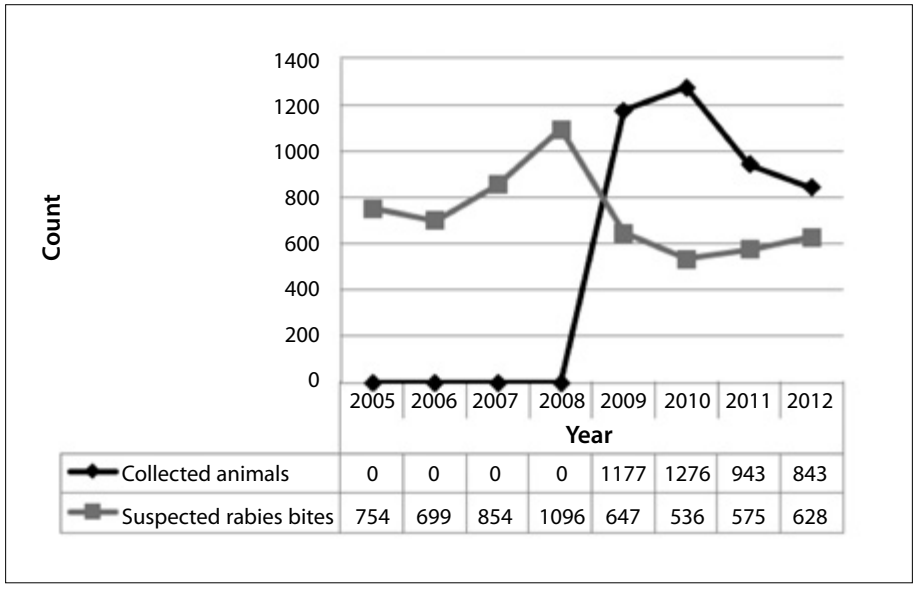

Figure 1. *Number of suspected rabies bites in Erzurum according to years and its relationship with the establishment of the animal shelter.*

Table 2. Number of vaccinations performed to suspected rabies bitten people in Erzurum according to years

	Number of applied vaccine schemes				
Year	2 doses	3 doses	5 doses	2+1+1	Total
2005	48	663	31	12	754
2006	5	618	68	8	699
2007	42	656	135	21	854
2008	32	792	261	11	1096
2009	32	374	228	13	647
2010	18	360	153	5	536
2011	16	339	217	3	575
2012	17	325	275	11	628
Total	210	4127	1368	84	5789

Discussion

This study showed that the establishment of the animal shelter in Erzurum has resulted in a substantial decrease in the number of suspected rabies bites. The most effective method in the struggle against rabies all over the world is regarded as the control of rabies among animals. Findings are similar to our study [9]. Fifty four percent of the total rabies cases are due to dog bites in humans all over the world, while 42% are due to wild animal bites. However, in Turkey 67% of the cases are due to dog bites while 30% are due to cat bites [10]. This is an indication that for Turkey the control of all domestic animals (by giving special attention to dogs and cats) is more important than other countries.

Rabies prophylaxis can be achieved by controlling rabies and applying prophylaxis to human before and after the contact with the disease. The control of human rabies includes basically controlling the disease among domestic animals, especially the dogs. For this, it is suggested that all owned domestic animals should be registered and periodically immunized; and of the street animals at least 70% should be immunized as well [11, 12]. Animal shelters are required in order to perform these activities on professional basis. In Erzurum, the animal shelter was put in action in the year 2009 and around 1000 street dogs were collected yearly. Within four years,

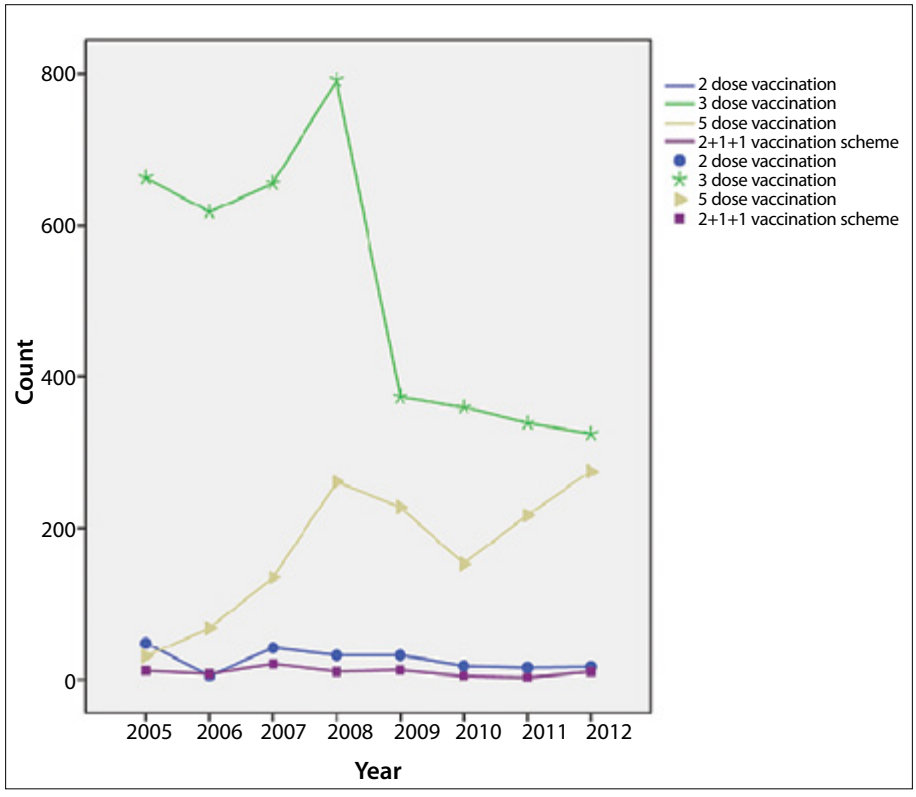

Figure 2. *Distribution of the vaccination schemes applied to suspected rabies cases according to years in Erzurum.*

almost 11 000 street dogs were rehabilitated by finding an owner, applying sterilization procedures and immunization. In addition to collecting the animals from the street, these are important services in the prevention of rabies.

The number of people with suspected rabies bites has decreased remarkably after the establishment of the animal shelter in Erzurum. It is important to note that the number of suspected rabies bites in all Turkey was 161 019 during the years 2005-2008 and this number increased to 167 604 during the years 2009-2012 (4% increase) [9]. We concluded that the reason for having a decrease in the number of suspected rabies bites in Erzurum despite a general rise in the cases in Turkey could be attributed to the establishment of the animal shelter.

The strong negative correlation between the number of collected animals and number of bites was expected and it indicates that collecting street animals is a very effective method in preventing rabies exposure.

We observed some change in the applied immunization schemes over time. 95% of the cases received 3-dose or 5-dose immunizations and there was a trend towards applying the five-dose scheme over time.

Considered that the cost of immunizing animals against rabies is 0.5 US Dollars compared with a cost of 5 US Dollars of immunizing humans, it is clearly evident that concentrating on animal immunizations is much more cost effective [9]. The additional costs such as anxiety, absence from work and other social problems make the immunization of animals much more important. This points out once more that animal control and immunization for controlling rabies is a cost-effective and humanitarian approach.

In conclusion **s**uspected rabies bites and rabies are common in Turkey and rabies cases are encountered. The number of suspected rabies bites has decreased substantially in Erzurum after the establishment of the animal shelter. Establishing rehabilitation centers for street animal in all cities will have a great impact in controlling the spread of rabies and other zoonotic diseases to humans.

Ethics Committee Approval: Ethics committee approval was not received due to the retrospective nature of this study.

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Conflict of Interest: No conflict of interest was declared by the authors.

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