

Five Year Analysis of Rabies Suspected Animal Contact Cases Which is A Significant Public Health Problem in The Southeast Anatolia Region

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Abstract

Background: Rabies is among the infections which has the highest fatality rate among all other infectious diseases. In our study we aimed to predict the precautions to be taken and review demographic characteristics of the cases that apply to Batman Regional State Hospital Emergency Service Rabies Unit.

Method: In our study between January 2012 – January 2017, 1591 patients have been examined retrospectively who apply to Batman Regional State Hospital Emergency Rabies Unit. Ages, genders, residential locations (urban/rural centers), whether the animal is a waif or reverse, species, wound location, whether the physical injury is deep or superficial, type of contact and application period after contact, whether prophylaxis is applied to the bitten patient or not and the season of contact of cases have been taken under registration.

Results: In our study average ages of our 1591 cases was $22,73 \pm 17,20$. 77,9% (n=1239) of cases were male and 22,1% (n=352) of cases were female and 70,3% (1119) of the cases have applied from the city centers, and the remaining 29,7% (472) of the cases have applied from the rural areas. 58% (n=922) of the animals were waif and the remaining 42% (n=669) of the animals had their owners and 62,7% (n=997) of these animals were dogs and the remaining 32,1% (511) of the animals were cats. 83,4% (n=1327) of the cases have applied to hospital immediately after the first day suspicious contact to emergency service. Totally to 40,7% (n=648) of these 1591 cases 3 doses, to 59,3% (n=943) 5 doses human diploid cell culture vaccine (HDCV) have been applied. Additionally, to 616 (38,7%) patients in addition to vaccine Human rabies immune globulin (HRIG) have been applied.

Conclusion: In conclusion, rabies infection is a serious public health problem in developing countries like in our country. It is rather significant from both the perspective of public health and from economic perspective to take under control the rabies of pets, raise awareness of public and healthcare staff and control of waif animals.

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Introduction

Rabies is a viral, zoonotic disease that generates in most of the human and mammals and encephalitis table (1). The determinant of rabies is a neurotropic RNA virus from the Lyssa virus genus of Rhabdo-viridea family (2). While the development risk of the disease is low on a surficial wound with the contact of infectious saliva, being bitten by the infected wolf from the head or neck part of the body the risk is 100%. Being bitten by a rabies infected animals' infectious saliva and even contact via solid mucosa, is resulted in an infection in rate averagely of 30-40% (1).

Rabies is an infection which has the highest mortality rates among the entire infectious diseases. Despite the fact that the first rabies vaccine was developed in the year 1885, according to the data of World Health Organization (WHO) every year still all over the world 30,000-70,000 people are dying because of the rabies (3). Most of these deaths occur in the developing countries because of the insufficient control of the disease in pets (4).

Within the field guide published by the Ministry of Health of Turkish Republic in year 2014, in year 2013 186.466 rabies risked contacts and 1 rabies case have been declared. Between the years 1998-2013 totally 27 rabies cases have been declared (1). Still our country that is endemic regarding the rabies diseases fight against rabies has an importance.

In this study it has been aimed to discuss the precautions possibly shall be taken and examination of demographic characteristics of the patients who applied to Batman Regional State Hospital Emergency Service Rabies Unit through risky animal contact.

Materials and Methods

In our study 1591 patients have been examined who applies to Batman Regional State Hospital Emergency Service Rabies Unit between the dates from January 2012- January 2017 retrospectively. Ages, genders, residential locations (urban/rural centers), whether the animal is a waif or reverse, species, wound location, whether the physical injury is deep or surficial, type of contact and application period after contact, whether prophylaxis is applied to the bitten patient or not and the season of contact of cases have been investigated.

Univariate statistical analysis for categorical variables has been executed via chi-square test and for continuous variables via using student-t test. Numerical variables have been given as mean \pm SD.

For the values of $P < 0,05$ have been considered statistically significant.

Results

1591 cases who apply to our hospital with animal bites and contacts have average ages of $22,73 \pm 17,20$. Distribution of the applying cases' according to their age groups has been given on (table 1). 77,9% (n=1239) of cases were male and 22,1% (n=352) of cases were female and 70,3% (1119) of the cases have applied from the city centers, and the remaining 29,7% (472) of the cases have applied from the rural areas. Most of the applications were done in spring (32%) and in summer (36%).

When we reviewed the animals, we have seen that 58 % (n=922) of them were waif, and 42% (n=669) of them had their owners. 62,7% (n=997) of the animals were dogs, 32,1% (511) of them were cats, 2% (n=32) of them were cows/oxes, 1,8% (n=28) of them were horses/donkeys, 1,2% (n=19) of them were monkeys and the remaining of them were mice-squirrels-bats-wolves-rabbits. When we reviewed the sequel of the animals we detected the fact that 5,4% (n=86) of them were killed, 42,4% (n=675) of them were alive, 52,2% (n=830) of them were lost.

It has been detected that mostly encountered type was contact type of biting with (85,2%). This was followed with a rate of 14,6% by scrabbling and with 0,3% indirect contact. 73% (n=1161) of the injuries after contact were surficial and 27% (n=430) of them were deep injuries. Major part of

surficial injuries was from with (75,9%) city centers, and deep injuries were from rural areas with the rate of (67%) and this situation was found statistically significant ($p < 0.05$). Mostly injured body parts were successively with (42,5%) from lower extremity zone and hands with 37,1% (table 2).

When we review application periods after suspicious contact to emergency service, we have seen that 83,4% ($n=1327$) of the patients have applied on the first day of being bitten, 14,1% of them have applied within 2-5 days and 2,6% of them have applied after the 5th day of being bitten.

Totally to 40,7% ($n=648$) of these 1591 cases apply with suspicious biting 3 doses, to 59,3% ($n=943$) 5 doses human diploid cell culture vaccine (HDCV) have been applied. Additionally, to 616 (38,7%) patients in addition to vaccine Human rabies immune globulin (HRIG) have been applied. In patients that 5 doses of vaccine have been applied HRIG application rate have been found significantly high ($p=0.001$), we have seen that for the ones who have deep scars after contact ($p < 0.001$), for the ones who have contact with the waif animals ($P=0.002$), for the contacts between the ages of 16-30 ($P < 0.001$), in contacts where suspicious animal is lost ($p=0.001$) HRIG application rate were significantly high.

In none of the 1591 cases that were taken into 5 years rabies vaccination program rabies infection has developed. But 2 of the cases have been examined at the inflectional diseases service because of their deep scars. Patients have been discharged with full recovery and without any problem.

Table 1. Distribution of cases applied according to their age groups

Age Groups	N	%
0-5	192	12,1
6-15	525	33
16-30	429	27
31-45	240	15,1
>45	205	12,9

Table 2. Distribution of cases according to their location of injuries in their bodies

	N	%
Head and Neck	85	5,3
Hand	591	37,1
Upper extremity	322	20,2
Low extremity	676	42,5
Chest	20	1,3
Body	71	4,5
Genital area	14	0,9

Discussion

Rabies is a viral, zoonotic disease that generates in most of the human and mammals and encephalitis table. Despite the fact that its factors and pathogenesis have been determined almost a century ago even for today it is a fatal disease. Within the literature there are 7 cases to be recovered after that the rabies clinical table has been developed, but there are suspicions of the diagnosis of some of these patients. Generally, around the world annually 55.000 people are known to be diagnosed with rabies. Our country regarding the rabies disease is still and endemic country. In our country annually averagely 180.000 rabies risky contacts are being declared and annually 1-2 rabies cases averagely are detected (1). In patients who are subjected to rabies after the proper

care of patients together with the human diploid cell vaccine HRIG application prevents the death of people almost 100% (5). As a result of the application of rabies vaccination protocols and with the precautions taken even though frequency of rabies cases to be encountered are decreased, it is still counted as risky at locations such as Southeast Anatolia Region where animal breeding is widely executed and socioeconomic levels are low. That's why; after the suspicious contacts vaccination has a great significance.

Patrick et al. within their study stated the fact that male gender has more rabies risky contacts than female gender (6). In our study in a similar way, because of the fact that women are less active in life as expected most of our cases consist of male population.

Söğüt et al. within their study it has been detected that age groups of 6-15 is subjected to animal bites in rate of (43,7%) and age group of 16- 30 is subjected to animal bites in rate of (24,8%), and the least subjection to animal bites are over the age category of 46 with the rate of (9%) and the age group of 0-5 with the rate of (9,3%) (7). In our study in a similar way age group subjection rates are detected as follows: age group 6-15 (33%), age group 16-30 (27%) and age group 0-5 (12,1%). Within the region where the income is compensated by animal breeding, we believe that the age of 30 and below, since active in working life are subjected to risky rabies contact more.

Within the studies executed it has been declared that urban contact is more than rural contact (7), (8). In our study 70,3% of the cases were from the city centers. The fact that in rural area residing people have still not the awareness to apply the rabies vaccination centers, the fact that transportation opportunities to vaccination centers are difficult, the fact that strayed animal control is hard shall be counted among the reasons why application from the urban areas with suspicious contacts is high.

Göktaş et al. within their studies, between the years 1995-1999 have stated that first day application rate was at the level of 80,8% (9). In our study in a similar way 83,4% of the patients have applied to the emergency services of our hospital within the first day of being bitten. First day applications have been found relatively higher than rural areas in urban areas. This situation indicates that rabies disease is frightened and people living in urban areas and in city centers following this fear have no problems in taking the necessary precautions but it is obvious that people living in public areas shall be informed more about the disease and gain awareness.

58% of the animals lead to suspicious contact was waif. Within the study executed by Temiz et al. in Diyarbakir waif animal percentage was detected highly again as 75% (8). The results of these two studies executed in close locations let us think that local administrations and authorities are insufficient in controlling waif animals and directing not the necessary attention to the subject. Insufficiency in the control of waif animals will lead the increase in vaccination costs further on.

In developing countries contamination of rabies to human being occurs with the biting of waif animals and especially with the bites of dogs, in developed countries where dog vaccination is executed regularly, rabies source for human is indicated as wild animals (10). In our country when last 20 years is evaluated it can be seen that 93% of the animals that are rabies are pets and the majority of these pets are dogs with the rate of 59% (1). Özsoy et al. within their study where they examined the cases to apply Ankara Refik Saydam Sanitation Centre Rabies Vaccination Station, bite cases were detected in rate of 68% of dogs and in rate of 25% of cats (11). In our study in a similar way 62% of the suspicious contact cases were based on dogs and 32,1% were based on cats. The fact that suspicious contact cases are based frequently on dogs makes it significant and necessary that rabies protective precautions shall especially focus on dogs.

On the field rabies guide published in year 2014 in our country and around the world with today's data in mouse, squirrel, rat, hamster, guinea pig, gerbil, rabbit and wild rabbit bites it has been

emphasized that there is no contamination to human of rabies and as long as a private data is provided in such types of animal bites prophylaxis is not required (1) but in our study after 7 mice, 3 squirrels, 9 wild rabbit contacts vaccination had been applied. We believe in the fact that healthcare staff shall be repeatedly informed regarding rabies prophylaxis within proper periods.

Within the study of Moran et al. executed in the USA only 6,7% of the suspicious contact applications have been vaccinated (12). In our study to every patient applied vaccination had been applied. We additionally have seen that in cases where the animals are waif and the scar depth is high vaccination dose were increased and more HRIG was applied. The fact that rabies risky contact cases are frequent and high, since most of them are vaccinated, this situation indicates the public health dimension of this problem and contacted animal tracking and observation is significant and also this situation shall be considered from economic aspects.

Within the literature incubation period in human rabies is stated earliest as 4 days and latest as 19 years, it varies from 1 month to 3 months in many of the cases (2), (13). In our study within 5 years period of time in examined 1591 cases no rabies infections have been encountered end up with the death, even if animal tracking is insufficient, the fact that in none of the cases rabies infection is encountered is significant to indicate how important vaccination is.

Conclusion

To conclude, rabies infection is a serious public health problem in developing countries like our country. In our country different from the developed countries, the fact that rabies suspicious contact cases based on pets are high indicates the reality that pet rabies is not still completely under control. Every time when a single vaccination cost is evaluated, taking under control the pet rabies both from public health aspect and from economic perspective, it is very significant to raise awareness among the public and healthcare staff and controlling the waif animals.

Conflicts of interest

There is no conflict of interest.

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