

## The Prevalence of Rabies and Animal Bites During 2004 to 2009 in North of Iran

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**Abstract:** Rabies is an infectious viral disease of central nervous system. This disease is found in most countries of the world from a long time ago and nowadays it is one of the medical difficulties in developing countries. This disease due to its high mortality rate in humans and animals is one of the important zoonotic diseases. This study aimed to determine prevalence of animal bite cases in Northern provinces of Iran during 2004 to 2009. After sending samples to north unit of Pasteur Institute located in Amol city, all samples were analyzed by indirect immunofluorescent technique and in the case of observing negrobodies, samples were announced as positive. Also negative samples were injected to mice. During this 6 years period the highest number of positive cases of this disease was observed in 2006 and the lowest number was in 2009. Because rabies is endemic in wild life of Iran, infection of domestic animals is occurring repeatedly, also increasing population of stray dogs and developing statistics of animal bite cases and dissipation of rabies in most provinces of Iran, notifies a need to pay more attention on controlling this disease.

**Key words:** Rabies • Zoonotic • Pasteur Institute • Direct fluorescence

### INTRODUCTION

Rabies is an acute fatal viral encephalitis that is usually transmitted from animals to man following domestic and wild animal bites [1]. This disease is one of the most important public health problems in some countries of the world such as those in the Eastern Mediterranean region [2]. According to the world health organization reports, more than 10 million people who are bitten by animals are annually treated by prophylactic treatment regimen of rabies in the world. About 50,000 human deaths are annually reported due to rabies [3]. The highest rates of mortality and morbidity in Asia are observed among developing countries for example India, Pakistan and Bangladesh which have high populations and have no specific strategies for controlling rabies. The real numbers of human deaths due to rabies in these countries are more than these numbers, because there is no advanced surveillance system of disease control to find out the real numbers of the infected and deceased

human cases [4]. Animal bites and stings are among the most common injuries, both in Iran and worldwide. In countries that animals and especially dogs, are kept in conditions of poor hygiene, dog bites are the most common animal bites and can result in complicated bacterial infection predominantly related to the dog's oral flora [5]. The present study was undertaken to evaluate the prevalence and other information's about rabies as well as the variables related to the bitten persons during 2004 to 2009 in Mazandaran province in North of Iran.

### MATERIALS AND METHODS

In this Cross-Sectional study, data related to morbidity of human rabies cases and all of recorded information related to person who was bitten by animals from April 2004 to December 2009 was determined. Suspicious cases of rabies were transferred to Pasteur Institute of North in two ways. In initial

years the head of the animal, considering safety points, was transferred to this institute and during recent years samples taken from occipital area of the brain was transferred to this unit in kits manufactured by Pasteur Institute company (Pas-78) which contained conservative solution. After sending the samples all the samples were analyzed by Indirect Immunofluorescent Technique and in case of observing negrobodies the samples were announced as positive. But, if the sample was negative a small amount of the sample was pounded in porcelain pounder and poured in 20 cc vials and then serum saline containing 500U/ml Penicillin and 1560µg/ml Streptomycin was added to it and a suspension of 10-20% was prepared. After 30 minutes 30µl of this suspension was injected to 12 Balb/c mice in the head using gage 26 syringe and these mice were kept for 28 days.

Fatalities up to fifth day was not due to rabies and after that was attributed to rabies. Then wet mounts from the brain of dead mice was prepared and analyzed by Indirect Immunofluorescent Technique. Conducted data

was statically analyzed using SPSS software and T and Chi square test.

## RESULTS

During a period of six years, this study was performed on cases that were referred to north unit of Pasteur Institute which is the only centre in northern provinces of the country for responding to them. During this six years period the highest number of positive cases of this disease was observed in 2006 and the lowest number was in 2009. Meanwhile, the rate of the disease in men was more than that of women and the difference was statically significant ( $P<0.01$ )(Table 1).

In this study animals suspicious of rabies that had attacked human were also analyzed. In positive cases dogs with a percentage of 57.39 and foxes and weasels with 0.86, respectively had the highest and lowest attack rates (Table 2). The highest number of infected cases was in 16-30 year old individuals (32.17%) and the lowest was in those over 60(6.95%) (Figure 1).

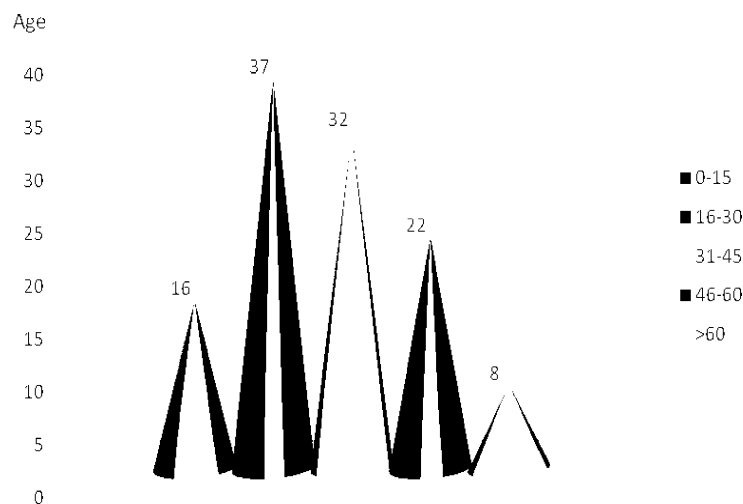


Fig. 1: Age distribution of persons who were bitten by animals during 2004-2009 in North of Iran Province

Table 1: Prevalence of rabies and animal bites in northern provinces during 2004-2009 according to morbidity, sex and place of residence

Year	Number of samples	Morbidity rate	Number of male patients	Number of female patients	Place of patient's residence	
					Urban	Rural
2004	31	14	10(71.42%)	4(28.58%)	6(42.86%)	8(57.14%)
2005	26	20	15(75%)	5(25%)	3(15%)	17(85%)
2006	53	37	27(72.97%)	10(27.03%)	3(8.1%)	34(91.89%)
2007	32	17	14(82.35%)	3(17.65%)	-	17(100%)
2008	24	18	13(72.22%)	5(27.78%)	-	18(100%)
2009	16	9	4(44.44%)	5(55.55%)	-	9(100%)

Table 2: Determination of rate of morbidity of animals infected with rabies in northern provinces during 2004-2009 according to type of the animal

Year	Dog	Wolf	Jackal	Fox	Cow	Sheep	Donkey	weasels
2004	7	-	2	-	3	1	1	-
2005	18	-	1	1	-	-	-	-
2006	12	-	-	-	16	8	-	1
2007	9	6	-	-	1	-	1	-
2008	14	-	-	-	4	-	-	-
2009	6	-	-	-	1	-	2	-
Total	66(57.39%)	6(5.21%)	3(2.6%)	1(0.86%)	25(21.73%)	9(7.82%)	4(3.47%)	1(0.86%)

## DISCUSSION

Rabies occupied an important situation in the history of medical research and is one of the diseases that can be important in human health [4]. Europe and North America have successfully controlled rabies in domestic animals and only wild animals are the source of rabies in these countries and dog bite is still the main way of transmission of disease to human [5]. As also shown in this study dog bite allocated the highest rate of incidence of rabies disease to itself (57.39% of the cases) which in comparison to other animals is significantly different.

According to Zeynali's report [6] more than 50,000 individuals each year undergo anti rabies treatments in Iran because of getting bitten by animals suspicious of rabies. Also, according to their analysis young individuals are at greater risk and more than 90% of cases are male [6] which is consistent with data obtained in this study.

In domestic animals the highest numbers of positive cases were seen in cows (21.73%) and according to Pasteur Institute's reports positive cases of rabies in cows in year 2003 and 2002 allocated 56.3 and 52.4%, to itself, respectively. Higher infected cases of cows between other domestic animals can be due to higher sensitivity to infection and also distinct symptoms of the disease in this animal. Whereas sensitivity of sheep and goat is less than cow and symptoms of the disease in these animals is not distinct like cow and many cases of rabies in sheep and goats can be misdiagnosed with other diseases and so will not be reported [3, 9].

In a study conducted by Rezaeinasab [7] during 1904-2003 in Kerman province 10 individuals were infected with rabies, 2 of them were female and 8 were male and half of them were attacked by dogs [7].

Because rabies is endemic in wild life of Iran, infection of domestic animals is occurring repeatedly, also increasing population of stray dogs and developing statistics of animal bite cases and dissipation of rabies in most provinces of Iran, notifies a need to pay more attention on controlling this disease.

## REFERENCES

1. Rad, M.A., 2004. *Zoonoses*. 3rd. Edition., compiled in Persian language, published by Tehran University Press, pp: 46-50.
2. WHO in the Eastern Mediterranean Region, 2000. Annual reports of regional director (1950-2000), Regional Office for Eastern Mediterranean Region, pp: 2-3.
3. Frederick, A., E. Morph, E. Gibbs and J. Paul, 1999. *Veterinary virology*. 3rd. Edn., Academic Press, pp: 432-438.
4. Bahonar, A.R., H. Rashidi, S. Simani, A. Fayaz, A.A. Haghdoost and M. Rezaie Nasab, 2005. Relative frequency of animal rabies and factors affecting it in Kerman province, 1993-2003.
5. Alavi, S.M. and L. Alavi, 2008. Epidemiology of animal bites and stings in Khuzestan, Iran, 1997- 2006. *J. Infection and Public Health*, 1: 51-55.
6. Zeynali, M., A. Fayaz and A. Nadim, 1999. Animal Bites and Rabies: Situation in Iran. *Archi Iranian Med.*, 2(3): 120-4.
7. Rezaeinasab, M., I. Rad, A.R. Bahonar, H. Rashidi, A. Fayaz, S. Simani, A.A. Haghdoost and F. Rad, 2007. The prevalence of rabies and animal bites during 1994 to 2003 in Kerman province, southeast of Iran. *Iranian Journal of Veterinary Research*, University of Shiraz, 8(4): 343-350.
8. Krebs, J.W., J.T. Wheeling and J.E. Childs, 2004. Rabies surveillance in the United States during 2002. *J. Am. Vet. Med. Assoc.*, 224(5): 705-708.
9. Simani, S., 2003. Rabies situation in Iran. *J. Faculty of Veterinary Medicine*, 2: 275-78.