

## Trend analysis of animal bite cases in a tertiary care center from the last six years hospital registry

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### Abstract

**Background:** India has one of the highest numbers of cases of Rabies in world.

**Objectives:** (1) Epidemiological study of animal bite cases attending Anti- Rabies clinic in accordance to Time place and person. (2) To analyze the trend and forecast the cases.

**Study design:** Cross-sectional record based study.

**Study place:** Anti-Rabies clinic, PBM Hospital, Bikaner.

**Study duration:** 3 month (Jan - March, 2014).

**Study tool:** Records of Anti-Rabies clinic and Isolation ward (Suspected Hydrophobia cases).  
Data analysis: The data was analyzed with application of Mean, Proportion, Chi-square and trend analyses using Microsoft Excel.

**Results:** Total no. of animal bite cases were 18,312 in last 6 years (2008-2013), the number of patients is continuously rising since 2011. Out of total cases, 93.2% were bitten by dogs, 4.7% gave history of raw milk ingestion, and 0.5% patients gave history of camel bite. Most of the patients were in 15-65 years of age group (59.8%) and followed by in 5-14 years of age group (28.4%). The males and females shared 76% and 24% proportion respectively. The urban area accounted to almost 70% of the cases. Total suspected hydrophobia cases were 112 in last 6 years. Forecasting for 2014 - 3988 cases and for year 2015-4268 cases. Seasonal predisposition was in May & June months.

**Conclusion:** The animal bite affects economically productive male population of Bikaner. Hot spots should be searched in urban areas to take necessary control measures effectively.

**Keywords:** Rabies, Animal bite cases, Hydrophobia

### Introduction

Rabies is a viral zoonosis and many carnivores and bat species are hosts of the rabies virus in nature. The virus is found in wild and some domestic animals, and is transmitted to other animals and to humans through their saliva (i.e. following bites, scratches, licks on broken skin and mucous membrane). In India, dogs are responsible

for about 97% of human rabies, followed by cats (2%), jackals, mongoose and others (1%). The disease is mainly transmitted by the bite of a rabid dog. Rabies has terrified man since antiquity. The fear is by no means unfounded since the disease is invariably fatal and perhaps the most painful and horrible of all communicable diseases in which the sick person is tormented at the

same time with thirst and fear of water (hydrophobia) (4). More than 3.3 billion people live in regions where there is a risk of rabies. Approximately 55,000 people die from rabies each year, the vast majority of these deaths occurring in Asia and Africa. Every year, more than 10 million people, mostly in Asia, receive post-exposure vaccination against this disease (9). More human deaths from rabies occur in Asia than anywhere else in the world, with estimates of human mortality due to endemic canine rabies exceeding 30,000 per annum (95% confidence interval [CI], 8100–61 400) in 2003 (2). India is reported to have the highest incidence of rabies globally. A multicentre study in 2003 showed that 20,565 human deaths occur annually (6), and a large-scale verbal autopsy study in 2005 put the figure conservatively at 12,700 (7). Most cases were reported in rural communities (7, 6) where no large-scale dog vaccination programmes have been conducted and where the incidence of dog rabies presumably remains high. While the availability of post-exposure prophylaxis has improved, it is not clear how much rural communities have benefited; furthermore, most deaths occur among people who do not seek medical care. The number of deaths due to rabies in India therefore remains uncertain. The cost of life-saving prophylaxis is a major burden both to national economies and to poor families as more data on increasing numbers of post-exposure prophylaxis provided annually are becoming available from countries such as China (e.g. reports of 10 million post-exposure prophylaxis treatments delivered in 2010) and India since 2004, suggesting higher exposure to the risk of contracting rabies even if a large proportion of these are not from rabid animals. The psychological impact of fear and trauma after a suspected rabid dog bite is difficult to translate into a monetary value but was estimated to account for about 32,000 DALYs in Africa and 140,000 DALYs in Asia (8). Poor

surveillance, underreporting in many developing countries, frequent misdiagnosis of rabies (3) and an absence of coordination among all the sectors involved are likely to lead to underestimation of the scale of the disease burden. Both country-specific burden studies and improved surveillance should be encouraged in order to obtain more reliable global estimates of the burden of rabies. The annual cost of livestock losses due to rabies is also substantial: approximately US\$ 12.3 million (90% CI, 11–13.7 million) (2), disproportionately affecting the rural poor who depend upon livestock for subsistence. India has an unusually high proportion of ownerless dogs. Dog population management has been used for canine rabies control in animal birth control programmes, in which free-roaming dogs are caught, sterilized and vaccinated before being released. Several locations have reported reductions in the number of human deaths from rabies during such programmes (5, 1).

### **Objectives**

- (1) Epidemiological study of animal bite cases attending Anti- Rabies clinic in accordance to Time place and person.
- (2) To analyze the trend and forecast the animal bite cases.

### **Methodology**

This retrospective study was conducted in PBM Hospital, Bikaner. Data were collected from the animal bite register maintained at PSM OPD. Records of suspected Hydrophobia cases were taken from isolation ward register. Trend was analyzed using MS excel.

### **Results**

Total numbers of cases were 18,312 in six years i.e. from 2008 to 2013. (Table 1) Male to female ratio is 3:1 and urban to rural ratio is also 3:1. Majority of cases were in 15-65 years of age group (59.8%) followed by 5-15 years (28.4%). Major site of bite was

lower limb (58%) and bites over head and neck was present among 11% of cases. (Table 2) Majority of animal bite cases were in April and May months and minimum in September month. (Fig.1). Maximum numbers of cases were of category III bite (67.8%) and pre-exposure prophylaxis were given to 585 (3.2%) cases.(Table 3) Major biting animal was dog (93.3%) and others

were cat, camel etc. (Table 4) Total suspected hydrophobia cases were 112 during the six year duration. (Table 5) Out of 112 cases majority were adult males (72.3%) followed by children. Maximum patients gave history of application of chilli powder, turmeric powder and lime following the bite.

**Table 1. Year wise distribution of Animal bite cases**

YEAR	NO. OF CASES
2008	2571
2009	2656
2010	2818
2011	3200
2012	3206
2013	3861
TOTAL	18,312

**Table 2: Socio-demographic profile of animal bite cases (n=18,312)**

Characteristics	Frequency (%)
<b>Gender</b>	
Male	13,975 (76.3%)
Female	4,337 (23.4%)
<b>Residential Area</b>	
Rural	5,203 (28.4%)
Urban	13,109 (71.5%)
<b>Age Groups</b>	
<5 years	1,654 (9.0%)
5-14 years	5,201 (28.4%)
15-65 years	10,958 (59.8%)
>65 years	499 (2.7%)
<b>Sites of Bite</b>	
Head & Neck	2,014 (10.9%)
Trunk and abdomen	2,382 (13.1%)
Upper limb	3,295 (17.9%)
Lower limb	10,621 (58.1%)

**Table 3. Distribution of animal bite cases according to category of bite**

Category	Frequency (%)
Cat-III	12,432 (67.8%)
Cat-II	5,295 (28.9%)
Pre-exposure	585 (3.2%)
Total	18312 (100%)

**Table 4: Distribution of cases according to biting animal.**

Biting animal	No of cases (%)
Dog	17,067 (93.2%)
Cat	73 (0.4%)
Camel	92 (0.5%)
Others	1080 (5.9%)
Total	18312 (100%)

**Table 5: Suspected hydrophobia cases admitted in isolation ward.**

Year	No. of patients
2008	14 (12.5%)
2009	13 (11.6%)
2010	18 (16.0%)
2011	18 (16.0%)
2012	23 (20.5%)
2013	26 (23.2%)
Total	112 (100%)

Linear Trend line with a positive slope and the value of  $R^2=0.8$  shows that the number of cases will increase with time (Fig.2). Forecast for the year 2014 = 3988 cases and for year 2015 = 4268 cases.

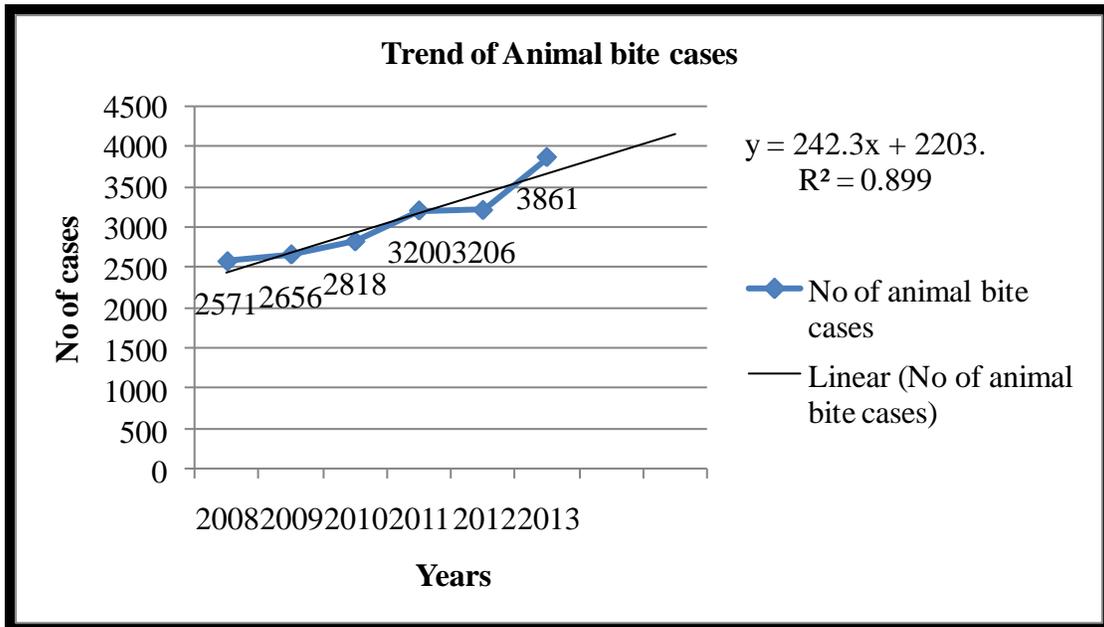
animals, particularly dogs, pre-exposure immunization of humans at risk of contracting the disease and on delivery of post-exposure prophylaxis to potentially exposed patients. Most of the studies are available on human rabies mortality and very few are on animal bite exposures. In present study we have identified the burden of animal bite cases both in rural and urban areas of Bikaner district.

**Discussion**

Where rabies is a public health issue, prevention of the disease in humans depends on a combination of interventions including control of rabies in both wild and domestic



**Fig 1. Seasonal pattern of animal bite cases**



**Fig 2. Trend analysis of Animal bite cases.**

We have found more cases from urban areas and this could be due to less reporting from rural areas due to lack of awareness. Most of the victims were adult males and this could be explained by the fact that adult males are more exposed to canines as they are staying outside their houses for various reasons. Bites over head and neck area can be due to the habit of sleeping outdoors and over upper limbs could be due to the culture practice of giving eatables to the stray dogs. Health education is essential for the prevention of these types of bites and also about not to have indigenous treatment like application of chilli powder or turmeric powder following the bite as it is a common practice both in rural and urban areas. There was a seasonal variation of animal bite cases this could be related to the breeding season of dogs and this information can be helpful for preventive measures. Dog was the responsible animal for majority of animal bite cases, so the prevention and control strategies should be directed towards the dog population control and simultaneous vaccination as shown in the study by J. F. Reece, S. K. Chawla (2006) in Jaipur, Rajasthan. Maximum Hydrophobia cases were LAMA and many would have not reported or reached to the hospital. Further verbal autopsy is needed at community level to find out the real number of hydrophobia cases.

### Conclusion

We concluded that the burden of animal bite case will increase in future and appropriate control measures with Intersectoral coordination should be started vigorously in endemic areas. Awareness of preventative measures is of utmost importance because prevention is the only cure for rabies in developing countries like India.

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