Original Research Article

Animal Bite Cases in Western Rajasthan, India: A Retrospective Study 2009-2015

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Abstract: Animal bites in humans are an important public health problem. Most of these bites are dog bites. Dog bites in humans are a complex problem embracing public health and animal welfare, both in developed and developing nations. In order to estimate the magnitude of the problem and to understand the epidemiological characteristics of dog bite victims registered in Anti Rabies Clinic of Dr. S.N. medical college, Jodhpur regarding their age, sex, number of registered dog bite victims per month and year along the studied period (2009-2015) and also to sniff out any seasonal variation in dog bite attacks. The present study was carried out by detailed examination of the records of animal bite patients who had attended the Anti Rabies Clinic of M. G. Hospital attached to Dr S. N. Medical College, Jodhpur for medical advice and post exposure immunization against rabies during last seven year period from January 1, 2009 and December 31, 2015. The data compiled in Microsoft excel 2010 were further analysed using SPSS version 21. The total number of registered animal bite victims per 7 years of the study was equal to 38561, distributed as (29,844 males and 8714 females), with male to female ratio equal to 3.5:1. The studied epidemiological characteristics showed that highest total number of registered dog bite victims during the year (2012). The persistence of dog bite as public health problem in Jodhpur district.
Keywords: Dog bite, Rabies, Epidemiological

INTRODUCTION

Rabies is probably the most feared of all human disease. It still remains one of the most dreadful and gruesome of all communicable zoonotic diseases with virtually 100% fatality rate. Rabies remains an important public health issue worldwide due to the prevalence of endemic animal rabies in developing countries. Dogs are the main reservoir; it is caused by a virus that gets into the human-body usually from an animal bite, scratch, or licks on broken skin or mucous membranes [1].

In India, rabies is known since Vedic periods as corroborated in Antherva Veda. The Latin word "Rabies" seems to have originated from the Sanskrit word "Rabhas" which means "to do violence" Primarily a zoonotic disease. All warm-blooded animals are susceptible to this infection.

Dog bites are a serious health problem that is not only cause increase morbidity and mortality but also loss of man days and money or treatment [2].

According to WHO report, ten million people are bitten by animals (especially dogs) around the world, considered for prophylaxis and treatment against rabies and almost (55,000) people die from this disease annually [3].

Dogs are the source of 99% of human rabies deaths [3, 4, 5]. Out of the total 55,000 deaths reported annually in the Afro-Asian countries, 56% are from Asian nations. 20,000 deaths are reported annually only in India [5]. In India rabies occurs in all parts of the country with exception of Lakshadweep, Andman and Nicobar islands. 30,000 deaths reported by national authorities may not be complete picture since these represent only the deaths reported from hospitals. It is estimated that the number of deaths due to rabies may be 10 times more than those reported [6].

Jodhpur is the second biggest district of the Rajasthan state. Jodhpur is situated in the North-Western part of Rajasthan. Jodhpur has an overall population of about 3.685 Million (Census-2011) and a

literacy Rate of 67 %. Animal bite cases specially dog bite cases are very much common in this western part the Rajasthan.

Researcher aimed through 7 years review of animal bite cases reported in tertiary care hospital of Jodhpur city as seen over the period (2009-2015) in order to estimate the magnitude of the problem and understand the local epidemiology and characteristics of animal bite victims regarding their age, sex, number of registered animal bite victims per year along the studied period in order also to sniff out any variation in animal bite attacks, the information will be used to plan prevention and enhance management strategies. Such studies can definitely help to make necessary modifications of the rabies control programme.

MATERIALS AND METHOD

The present study is a hospital based retrospective study, carried out by detailed examination of the records of patients who had attended the Anti Rabies Clinic of M. G. Hospital attached to Dr S. N. Medical college, Jodhpur for medical advice and post exposure immunization against rabies during last seven year period (from 1st January 2009 to 31st December 2015).

Anti-Rabies Clinic of Dr. S. N. Medical College, Jodhpur is largest Anti Rabies Clinic in Western Rajasthan. The Clinic records an average of 100-150 cases per week. Primary clinical records of animal bite victims between 1st January 2009 to 31st December 2015 were accessed and analysed retrospectively. The data compiled in Microsoft excel 2010 were further analysed using SPSS version 21.

The data pertaining to victims were studied regarding their gender, sex and number of patient per year along the studied period, the researcher choose 7 years of data analysis that would supply sufficient event number, in order to enable us to sniff out any seasonal variation in animal bite injuries.

STATISTICAL ANALYSIS

Statistical tables, percentage and proportions

RESULT:

Table 1: Year wise distribution of Animal-bite victims reported to ARV Clinic, MG Hospital, Jodhpur between Jan 2009 and Dec 2015

Year	Males		Females		Total	
	No.	%	No.	%	No.	%
2009	3366	77.2	993	22.7	4359	100
2010	3,303	78.2	922	21.8	4225	100
2011	3973	77.3	1168	22.7	5141	100
2012	4877	77.0	1460	23.0	6337	100
2013	4784	78.1	1341	21.9	6125	100
2014	4798	77.1	1424	22.9	6222	100
2015	4743	77.0	1409	23.0	6152	100
Total	29,844	77.4	8717	22.6	38,561	100

The results show that the total number of animal bite victims was (38,561) per 7 year of study (2009-2015), distributed as (29,844 males and 8717 females), with male to female ratio equal to 3.5: 1.The highest reported animal bite victims was during the year (2012) compared to other years. Number of animal bite cases reported to ARV clinic was almost constant after year 2012.

Table 2: Age wise distribution of Animal-bite victims reported to AR Clinic, MG Hospital, Jodhpur between Jan. 2009 and Dec. 2015

Year	Animal Bite Victims				Total	
	Children		Adult			
	No.	%	No.	%	No.	%
2009	1699	39.0	2660	61.0	4359	100
2010	1661	39.3	2564	60.7	4225	100
2011	1874	36.5	3267	63.5	5141	100
2012	2175	34.3	4162	65.7	6337	100
2013	2276	37.2	3849	62.8	6125	100
2014	2258	36.3	3964	63.7	6222	100
2015	2154	35.0	3998	65.0	6152	100
Total	14097	36.5	24464	63.5	38,561	100

The results show that dog bite victims in the age group (>15) years were more affected .The total number of animal bite victims was (38,561) per 7 year of study (2009-2015), distributed as (24,464 Adult and 14,097 Children), with adult to children ratio equal to 1.7: 1.

Table 3: Distribution of Animal-bite victims reported to ARV Clinic, MG Hospital Jodhpur between Jan 2009 and Dec. 2015 on the basis of categorization of cases

Year	Cat· I		Cat· II		Cat· III		Total	
	No.	%	No.	%	No.	%	No.	%
2009	167	3.8	1222	28.0	2970	68.2	4359	100
2010	152	3.6	1174	27.8	2899	68.6	4225	100
2011	20	0.4	1112	21.6	4009	78.0	5141	100
2012	19	0.3	1877	29.6	4441	70.1	6337	100
2013	25	0.4	1923	31.4	4177	68.2	6125	100
2014	13	0.2	3642	58.5	2567	41.3	6222	100
2015	32	0.5	4744	77.1	1376	22.4	6152	100
Total	428	1.1	15694	40.7	22439	58.2	38,561	100

More than 50% of cases (58.2%) were having category III exposure (According to WHO categorization). Only 1.1% were category I exposure which did not require any treatment. From year 2009 to 2013, majority of cases were having category III exposure but in year 2014 and 2015 category II exposure cases were more reported. In year 2015 majority of cases (77.1%) were category II exposure.

Table 4: Distribution of animal bite victims reported to ARV Clinic, MG Hospital, Jodhpur between Jan 2009 and Dec. 2015, on the basis of type of biting animal

Year	Dog Bite Patient		Other Bite Victim*		Total	
	No.	%	No.	%	No.	%
2009	4143	95.0	216	5.0	4359	100
2010	3948	93.4	277	6.6	4225	100
2011	4829	93.9	312	6.1	5141	100
2012	5957	94.0	380	6.0	6337	100
2013	5744	93.8	381	6.2	6125	100
2014	5787	93..0	435	7.0	6222	100
2015	5743	93.3	409	6.7	6152	100
Total	36,151	93.7	2410	6.3	38,561	100

Dog was the most common (93.7%) animal associated with overall bite cases during last seven year period.

DISCUSSION

The present study was carried out by detailed examination of the records of animal bite patients who had attended the Anti Rabies Clinic of M. G. Hospital attached to Dr S. N. Medical College, Jodhpur for medical advice and post exposure immunization against rabies during last five year period from January 1, 2009 and December 31, 2015.

This Anti Rabies Clinic is the largest Anti Rabies Clinic in Jodhpur city, so these data provide a rough idea of overall load of animal bite cases in Jodhpur city during the last seven year period (2009-2015).The highest number (6337) of cases was during the year 2012.Majority of cases were males (77.4%) and occurred in adults (>15 years age group). Most of animal bites were dog bites (93.7%).

The total number of patients reported in Anti Rabies Clinic of Dr S. N. Medical College, Jodhpur during the study period (2009-2013) was equal to 38,561 cases. The epidemiological profile of animal bite victims revealed that maximum number of animal bite cases were in the men (77.4%).Men were affected more than women (with the gender ratio of 3.5: 1) this could be explained due to the fact that men are more likely to go out of their homes for work as compared with women especially in traditional and developing countries.

Similar findings were observed by Pratibha Chauhan _et al_ [7] they showed that 44.7% of the study subjects were men. Study conducted by Indu D _et al_ [8] showed that 57.7% of the study subjects were men. In a study conducted by T. R. Behera _et al_ [9] the maximum number (69.9 %) of the cases were men.

Khokhar _et al_ [10] and other studies [11, 12] showed the predominance of male victims among people living in other parts of our country, Khuzestan and Nigeria, respectively. In our study per 7 years of the data showed that animal bite were commoner with adult age group (>15 years age group) as they are considered to be the most agile group. Study conducted by Shelton

K [4]   and Oertli *et al* [13] similar finding were reported..

Contrary to this study, in some studies [2, 7, 14-16] it is seen that children are the most frequent victim of dog bite. Children's small size may encourage a dog to act dominantly towards them. Many children's lack of judgement about how to deal with a dog, and their inability to fend off an attack, may put them at additional risk. Children do not recognise the angry or defensive behaviour of the dog and continue to play with them which the dog consider as the invasion of territory and may incite an attack.

The study of 7 years animal bite data showed that more than half of the dog bite case belongs to WHO Category III exposure (50.6%).In year 2009 to 2013; most of the animal bite cases have Category III exposure. Similar findings were observed by Dr. Indu D *et al* [8] they observed that 57.1 % of the cases were Category III bites. Similar observations were also observed by Khokhar *et al* [10].

In year 2014 and 2015, WHO Category II exposure cases were more reported at this tertiary care ARV Clinic. Reporting of WHO Category III exposure cases were reduced at tertiary ARV clinic because government have strengthen the availability of Anti-Rabies Vaccine & Anti-Rabies Serum/ Human Rabies Immunoglobulin's (HRIg) at Primary health care level (e g. Primary Health Centres (PHCs) & Community Health Centres (CHCs).

The study showed that the most common biting animal was dog (93.7%) followed by the other animal (6.7%). Similar findings were observed by Pratibha Chauhan *et al* [7] they observed that majority (74.1%) of the cases was bitten by the dogs. Study conducted by Dr. Indu D *et al* [7] observed that majority (74.1%) of the cases were bitten by the dogs. A study by Renu Bedi *et al*. [17] in Ajmer found that dog bites contributed to 90.7% of the animal bits. A similar finding of 84.5% was obtained by T. R. Behera, D. M. Sathapathy *et al*. [9].

In most of the studies performed inside and outside the country, dogs ranked first. This indicates the importance of collaring and vaccinating domestic and sheep dogs and the necessity of eliminating curs. In a study conducted by Neil *et al* [18] it was observed that animal bites pose a major public health threat both in developed and developing nations. In a study conducted by Gupta *et al.* [19] showed that people of all ages, races and sex are potentially at risk for dog bite, and it is unlikely that dogs discriminate.

LIMITATIONS OF THIS STUDY
The real number of animal bite cases might be more because a number of people do not seek medical treatment post- exposure specially regarding small bites

also the lack of standard reporting in our country makes accurate estimates of the exact incidence of animal bite injuries in our study is difficult. Active animal bite surveillance studies as required to determine the true burden of dog bite in Jodhpur city.

CONCLUSIONS
The study shows that adult males have higher incidence of animal bite than the adult females. This is due to the more outdoor activity of the males. The most common biting animal is dog and the most common site of bite is lower limbs in adults. The study also shows that Category III bites (exposure) were more common.

The persistence of dog bites as public health problem in Jodhpur city. Dogs are responsible in maintaing the continuous persistence as well dissemination of rabies in the country. An accurate estimate of the incidence of dog bite cases in Jodhpur city is difficult as many dog bites are under reported.

RECOMMENDATIONS
1. Health education to enhance public awareness regarding the problem and to avoid contact with to stray dogs.
2. Vaccination of dogs against rabies especially before the breeding seasons.
3. Control of stray and free roaming dogs would reduce the incidence of dog bite and rabies.
4. Efforts should be made to fully incorporate rabies control activities to all levels of the health services, aligning them with other public health programes.

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