

Study of Category III Animal Bite in Anti-Rabies Vaccination Centre at Tertiary Care Hospital, India

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ABSTRACT

Background: Rabies is a 100% vaccine-preventable and 100% fatal zoonotic disease. Among all category bites, category III animal bites were most risky and one of the major category of transmitting virus and causing rabies. So our objective is to study case profile of category III animal bite cases.

Materials and methods: This study carried out on 1070 category III animal bites cases at Anti-Rabies Vaccine Center of tertiary care hospital, who availed post exposure prophylaxis from January 2014 to December 2017. Secondary data of category III animal bites cases were analyzed. Frequencies and proportions were calculated for quantitative data. Qualitative data were analyzed by using Chi square test. Statistical significance will be taken at 95% confidence limit.

Result: Mean age of child population is 6.44 years (SD±2.94) and mean age of adult population (> 12 years) is 42.96 years (SD±18.14). Young children (0-6 yrs) had got most common (61.1%) category III animal bite and commonly on face, head and neck (66.4%). Regarding biting pattern there were no difference between girls and boys but significantly more adult male (76.8%) were bitten by animals than adult female (23.2%). (p<0.05) Number of category III animal bites was increasing over the period of four year.

Conclusions: Younger children had got more category III animal bite as they cannot protect themselves. Number of cases of animal biting was increasing and hence cost of treatment. Such trend is dangerous for future.

Key words: Category III animal bite, children, adult, Anti Rabies Vaccination Centre.

INTRODUCTION

Rabies has terrified man since antiquity. The disease is invariably fatal and most painful and horrible of all communicable zoonotic diseases. Patient of rabies distressed with the thirst and fear of water called as hydrophobia.

Rabies is an acute disease that causes fatal encephalitis in virtually all warm blooded animals including man. The virus is found in wild and some domestic

animals, and transmitted to other animals and to humans through their saliva (i. e. following bites, scratches, licks on broken skin and mucous membrane).^[1]

India made rabies a priority disease for control for the first time in 2014 in its 12th national program of work. In December 2015, WHO, the World Organization of Animal Health, the Food and Agriculture Organization of the United Nations, and Global Alliance for Rabies Control, noting

that reaching zero rabies deaths is feasible. [2]

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 rabid dog. Development of rabies can be prevented if animal bites are managed properly in time. In this regards the post-exposure treatment of animal bite cases is extremely important. [1]

This study is planned to find out demographic factors and trends of category III animal bite cases occurred in four years duration from January 2014 to December 2017 in ARV Centre at tertiary care hospital, Yavatmal, Maharashtra, India.

MATERIALS AND METHODS

This study carried out at ARV Centre at tertiary care hospital, Yavatmal, on the category III animal bite cases availed services during January 2014 to December 2017.

Inclusion criteria: All category III animal bites cases came to ARV Centre in four years period. Definition of category III

animal bite patients according to WHO guidelines i. e. those patients who get single or multiple transdermal bites, scratches or contamination of mucous membrane with saliva i. e. licks.

Exclusion criteria: Those patients who doesn't fulfilled inclusion criteria

Data collection: Secondary data were corrected and enter into excel version Microsoft Office 2010 and analyzed. Total number of category III animal bites was 1070. In this data socio-demographic characteristics were collected, such as age, sex, area of residence, type of biting animal, trend of animal bite in four years and total volume of ARS and ARV consumed in four year.

Statistical analysis: Data corrected and enter into excel sheet. Frequencies and proportions were calculated for quantitative data. Qualitative data were analyzed and Chi square test was applied. Statistical significance would be taken at 95% confidence limit.

Ethical Approval: Ethical approval taken from ethical committee of our medical college.

Table 1: Socio-demographic features of Children of Category III animal bite. (N=355)

Years→ Variables↓	2014 n (%)	2015 n (%)	2016 n (%)	2017 n (%)	Total n (%)	Chi square test
Total	63 (100)	57(100)	96(100)	139(100)	355(100)	
Age (in years)						
0-6	46(73.0)	34(57.4)	64(55.5)	73(52.8)	217(61.1)	0.06
7-12	17(27.0)	23(42.6)	32(44.4)	66(47.1)	138(38.8)	
Sex						
Boys	38(60.3)	37(63.0)	63(70.8)	101(31.7)	239(67.4)	0.12
Girls	25(39.7)	20(37.0)	33(29.1)	38(24.4)	116(32.6)	
Area						
Rural	35(55.5)	25(40.7)	40(38.8)	78(56.9)	178(50.1)	0.03*
Urban	28(44.4)	32(59.2)	56(61.1)	61(43.1)	177(49.8)	
Type of Animal						
Dog	44(69.8)	49(85.2)	73(84.7)	125(95.1)	291(81.9)	0.000#
Other	19(30.1)	08(14.8)	23(15.3)	14(4.9)	64(18.0)	

*significant at 5% and# significant at 1%

Figures in table 1 showed that majority of younger children (61.1%) were of category III animal bite. But there were significant difference in category III biting among rural and urban children. ($p < 0.05$) Also there were statistically significant numbers of dog biting than other animals. ($p < 0.001$)

Table 2 depicts that there were no age difference among dog biting pattern among adult group. ($p > 0.05$) Mainly men were suffered from category III bite than female. ($p < 0.001$) People from rural area were more commonly getting category III dog bite than urban. ($p < 0.001$) Majority (77%) of adult people got category III bite by dog animal. ($p < 0.001$)

Table 2: Socio-demographic characteristics of Adults of Category III dog bite (N=715)

Years→ Variables↓	2014 n (%)	2015 n (%)	2016 n (%)	2017 n (%)	Total n (%)	Chi square test
Total	85(100)	117(100)	188(100)	325(100)	715(100)	
Age (in years)						
12-20	07(8.2)	18(15.3)	21(11.1)	35(10.7)	81(11.3)	0.15
20-40	35(41.2)	44(37.6)	56(29.8)	104(32.0)	239(33.4)	
40-60	30(35.3)	42(35.9)	76(40.4)	113(34.7)	261(36.5)	
>60	13(15.3)	13(15.3)	35(18.6)	73(22.5)	134(18.7)	
Sex						
Male	53(62.3)	82(70.1)	170(90.4)	244(75.1)	549(76.8)	0.000#
Female	32(37.6)	35(29.9)	18(9.6)	81(24.9)	166(23.2)	
Area						
Rural	53(62.3)	43(36.7)	95(50.5)	210(64.6)	401(56.0)	0.000#
Urban	32(37.6)	74(63.2)	93(49.4)	115(35.4)	314(43.9)	
Animal Bite						
Dog	50(58.8)	69(58.9)	153(81.4)	279(85.8)	551(77.0)	0.000#
Other	35(41.2)	48(41.0)	35(18.6)	46(14.1)	164(22.9)	

#significant at 1% level

Table 3: Category III dog bite in children and adult based on site of body(N=715)

Variables→ Age (in years)↓	Head/ Neck /Face		Both limbs/ trunk		Total		Chi square test
	n	%	n	%	n	%	
Children	236	66.4	119	33.5	355	100	435.18
Adults	48	6.7	668	93.4	715	100	0.0000

#Significant at 1% level

Table 3 showed that majority (66.4%) of children got category III animal bite on head, neck and face than any other part of body. But in contrast to this most common biting site were limbs (upper & lower) and trunk in case of adults. (93.4%)(p<0.001)

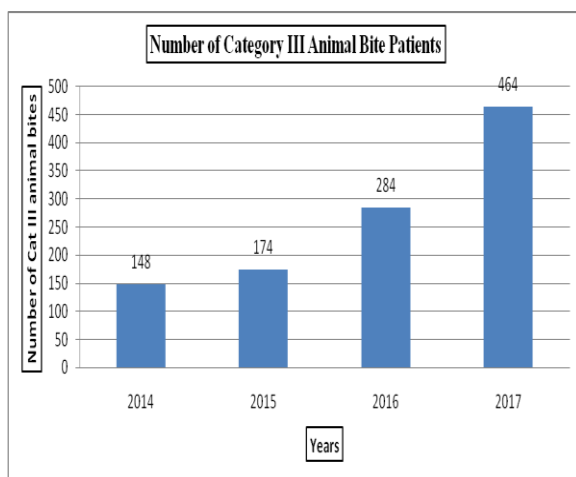


Figure 1: Total number of Category III patients of animal bite during 2014 to 2017.

In present study figure 1 reflected increasing number of animal bite cases over the period of four years from 148 cases in the year 2014 to 464 cases in 2017

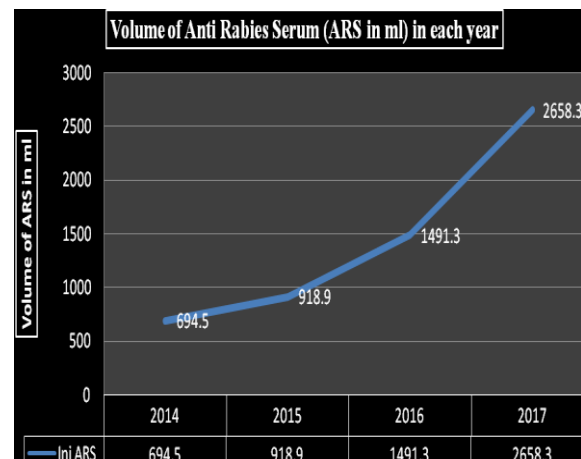


Figure 2: Volume of Anti Rabies Serum (ARS in ml) during 2014 to 2017.

Figure 2 reflected total volume of ARS required for category III animal bites went on increasing year by year from 694.5 ml in baseline year 2014 to 2658.3 ml in year 2017.

DISCUSSION

Present study focuses light on an important issue of category III animal bite which we people most concern among all bite categories, in tribal district Yavatmal of Maharashtra State of India. In this study we analyzed secondary data of Anti-Rabies Vaccination (ARV) Center for four years

from January 2014 to December 2017. We retrieved data from tertiary care hospital.

Majority of (61.1%) category III animal bite children were from younger age (0-6yrs) group than elder children (>6 to 12 yrs) (38.8%). Similar findings were found by Reuhl et al. He described 20 fatal dog attacks in a 10-year period in Germany, Switzerland, and Austria, with half of the victims being children who were younger than 8 years (median: 2 years, 7 months).^[3] In our study around two third (67.4%) children were boys and one third was girls (32.6%).^[4] However, there were no difference in biting pattern between boys and girls. Children from rural area had significantly more category III animal bites than urban children.^[5] Most common biting animal was dog among all animals.^[1-5]

Among adult group, most of the adult suffered from category III animal bite were from 40 to 60 years age group (36.5%) followed by 20 to 40 years (33.4%) this difference might be because of younger people may interact differently with dogs than older people. Elder people playing roughly interact and play with them or these people may even attempt to separate two fighting dogs. Such types of activities make them more vulnerable to bite to lower and upper limbs.^[6] Meaningfully more men (76.8%) had got category III animal bite than female (23.2%). This is most probably because they are highly kinetic and they are mostly engaged in outdoor activities without proper precautions. It might be due to men's are more exposed to external environment than female.^[7] People from rural area highly getting category III animal bite than urban people. Also majority of bite victims from rural area and from urban slums being poor, invariably go to government hospitals where rabies post-exposure treatment were provided free of cost.^[8] So they were getting reported in our study. Majority of category III animal bite were from dog only (77%). Our study findings match with other study.^[4]

Significant numbers of children got category III animal bite on head, neck and

face. Our findings have resemblance with another study results.^[4] While biting sites were limbs (upper & lower) and trunk in case of adults. These findings are in line with the study done by Ravish S. et al and others.^[8-12] There is strong evidence of a difference in the distribution of injury location by age group. Injuries to the head, mostly to the face were significant more common for the younger age groups.^[13]

In our study there was increasing number of animal bite patients over the period of four years from 2014 to 2017. So it is need of time, to give due attention to this sensitive issue. Otherwise in future it became an alarming problem. Also total volume of Anti Rabies Serum (ARS) required for category III animal bites were increasing year by year and cost of treatment. So it's an urgent need to address this issue at priority otherwise it consume lot of money in future, in term of as ARS and ARV as both injectable are too costly.

Limitations: This is analysis of secondary data, so findings of this study cannot be generalized. This data is from individual one tertiary hospital only. We analyzed only four years data and that to only category III animal bites, so results could be generalized with cautions. Sample cases of category III animal bites were from those cases that availed service from study hospital only. There might be chances of non-reporting of category III cases that took post exposure treatment from private doctors or took indigenous medicine from traditional healers.

Recommendations: Some other kind of study should be planned to ascertain true picture on this burning issue and find out way forward.

CONCLUSIONS

Younger children had got more category III animal bite than older children as they were unable to protect themselves. Boys and girls bitten equally and had most common injuries on head, neck, face. In childhood period whether they are boys or

girls activities and exposure to animal were same. Also head, face and neck area commonly approachable to dog, may be height wise. Whereas adults were got animal bite injuries on lower and upper limbs as their limbs were more approachable biting site. People from rural area affected more than urban. Since antiquity human lived with dogs and domesticated them, so most common biting animal. Number of cases of animal biting was increasing in successive years and hence cost of treating them also increasing. Such trend is not good for future. So this is hot topic should give due attention on priority basis.

Conflict of interest: No conflict of interest.

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