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Research Article

EPIDEMIOLOGICAL DETERMINANTS OF ANIMAL BITE CASES ATTENDING THE ANTI- RABIES IMMUNIZATION (ARV) OPD IN SASSOON HOSPITAL, PUNE

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ABSTRACT
Though rabies is a global burden, India alone contributes an estimated 20000 deaths with 17.4 million exposures to animal bite occurring every year. It is estimated that in the absence of the post exposure prophylaxis about 3,27,000 people would die annually. Hence, the present study is undertaken to know the various epidemiological determinants of animal bite cases attending the anti- rabies immunization clinic in Sassoon General hospital, Pune. Study design -Descriptive retrospective study. Data from ARV clinic was analyzed for the year 2014. The cases are classified as per WHO classification for animal bites. Proper wound care is given to each patient, and then they administered post exposure prophylaxis by administering anti rabies vaccine. Category three patients are also given anti rabies serum along with the vaccine. The vaccine is given by intradermal route and updated Thai red cross regimen is used. Analysis of data was done using SPSS software 17 version. A total of 3226 animal bite cases attended ARV OPD in the year 2014. Majority of cases were males and children of <15 years of age. Most of them were of category III exposure and majority (94.9%) of them were bitten by dogs. Only 26% of patients visited the ARV OPD on the same day of dog bite. Very few 710(22%) were able to complete the vaccine schedule. The people should be educated regarding the importance of wound washing and taking anti rabies vaccine as early as possible. This is the only measure to prevent occurrence of rabies. Local and state government administration must be geared up, to reduce the load of stray dogs by catching them followed by sterilization.

Keywords: *Rabies, Immunization, Animal Bite, Stray Dogs, Anti Rabies Vaccine*

INTRODUCTION
Rabies is a fatal viral zoonosis & serious public health problem. It is 100% fatal yet 100% preventable disease. It is estimated that the South East Asia Region accounts for approximately 60% of human deaths due to rabies in the world (WHO, 2004). In India alone Rabies causes an estimated 20000 deaths with 17.4 million exposures to animal bite occurring every year (WHO). Thus, the burden of the disease in India comes around 2 per lac population & is substantial. The figures might be even higher as the disease is neither reported nor notified. It is estimated that in the absence of the post exposure prophylaxis about 3,27,000 people would die from rabies every year just in Asia & Africa (WHO, 2010).

It is important to know about epidemiology of animal bites, rabies and factors influencing post exposure treatment for preventing human deaths due to rabies and formulate rabies control strategies. Hence the present study is undertaken to know the various epidemiological determinants of animal bite cases attending the anti- rabies immunization (ARV) OPD in B.J. Govt. Medical College and Sassoon General hospital, Pune.

MATERIALS AND METHODS
Descriptive retrospective study was done in ARV OPD, Sassoon General Hospital (SGH), Pune. The ARV clinic at Sassoon General Hospital caters to management and treatment of animal bite cases in and around Pune city. The data of all animal bite cases who reported to the ARV clinic in the year 2014 from 1st January to 31st December were extracted from the ARV clinic records. The data collected included following information:

1. Socio-demographic variables: age, sex, occupation, literacy etc were considered for the study.

2. Variables related to animal bite: animal who bit, type of animal, stray, wild, pet, community dog, bite provoked – unprovoked, whether animal is rabid, immunized or so, animal alive or dead or killed.
3. Variables related to wound: site of wound, whether oozing of blood present or absent, wound toilet, whether wound sutured or not.

Classification of wound was done as per WHO guidelines[4]. Proper wound care was given to each patient, and then they are administered post exposure prophylaxis by administering anti rabies vaccine. The vaccine is given by intradermal route and updated Thai red cross regimen is used. Total four doses of cell cultured vaccines were given 2-2-2-0-2 on days zero, three, seven and twenty eight days. The vaccine was given on two sites 0.1 ml on two arms by intra dermal route. All category three patients and immune compromised category II patients were also administered anti rabies serum along with the vaccine as per WHO guidelines[4]. Pre-designed and pre-tested proforma were used for collection of data. Data was analysed using SPSS software 17 version. The study was approved by Institutional review board.

RESULTS AND DISCUSSION

A total of 3226 patients attended ARV OPD in the year 2014 and were enrolled in the study. Majority of patients who attended ARV clinic had history of dog bite 3060(95%), followed by cat bite 90(2.8 %), monkey bite 14(0.4%), pig bite 14(0.4%) and cattle bite which includes cow, buffaloes 13(0.4%). The bites due to other animals was less than 1%.There were others 19 who had history of consumption of raw milk of rabid animal, 11 patients had history of contact with rabies case.

Age and Sex Distribution of Patients

It is evident that males 2439(70.0%) were affected more than the female patients as per the animal bite is concerned in all age groups. Animal bites were more commonly seen in children younger age group of < 15 yrs children (table-2). The trend shows (figure 1) slightly less patients above age 25, but there is substantial increase in number of old age people above 55yrs getting affected 433(13.3%).

Categorisation of Animal Bite and Delay in Reporting

The patients attending ARV were classified as per WHO classification[4] for exposure to animal bites. Majority of patients 2825(86%) were classified as category III patients (figure 2). In category II there were 429(13%) patients who were administered intradermal ARV vaccine as per upgraded Thai Red Cross regimen. Category III patients and immunocompromised Category II patients were also administered equine anti rabies serum with a dose of 40 IU/kg. The wounds were infiltrated with anti rabies serum. As far as the reporting of animal bite cases to ARV clinic is concerned 849 (26%) of patients reported immediately on the same day of bite for treatment without any delays. Nearly, 947(29%) of patients attended ARV clinic the next day with a delay between 24-48 hours. The rest 1404(43%) could visit the clinic from 3rd day to 30 days. The delay of more than a month was noted in 66(2%) patients (table 3).

Wound Toilet after Animal Bite

Out of total 3226 patients, only 1089(33.76 %) had washed their wounds with soap and water after the bite. Nearly,1194 (37.01%) patients applied Indigenous products like Chilli Powder, Halad and Chuna at the bite site and more than half of the patients 1852 (57.40%) did not take any measures after the bite of the animal (table 4). The ARV clinic at SGH also has a small bathroom for cleaning of wound (as per WHO guidelines). Irrespective of wound cleaned by the patient at home, the policy is made to wash the wound in the clinic before administering ARV vaccine to each patient.

Dropouts in taking ARV Vaccine

In spite of emphasizing on importance of taking anti rabies vaccine and completing the schedule, many patients were unable to attend ARV clinic for treatment completion. Out of 3226 patients taking 1st dose of ARV vaccine only 1987 (61.67%) were able to receive the 2nd dose of vaccine. Very few 710(22%) were able to complete the vaccine schedule due to various reasons.

Discussion

Rabies is one of the deadliest diseases of mankind. Once the disease is ascertained death is almost undeniable in affected individuals. But its 100% Preventable disease if proper precautionary measures are

taken. Hence, this study was undertaken to know the various epidemiological determinants of animal bite cases in Sassoon ARV OPD.

In the present study children and men were most commonly affected because of their outdoor activities. Similar findings were observed in other studies also (Sudarshan *et al.*, 1995; Singh *et al.*, 2001; Sudarshan *et al.*, 2001; Agrawal and Reddaiah, 2002). The most common biting animal was dog especially stray dogs (94.9%). This observation was seen in other studies also (Sudarshan *et al.*, 1995; Singh *et al.*, 2001; Sudarshan *et al.*, 2001; Agrawal and Reddaiah, 2002; National Institute of Communicable Diseases, 2000).

Table 1: Distribution of patients attending ARV clinic according to type of animal bite

Type of animal	Number of Patients (%)
Pet dog	883(27.4)
Stray dog	2177(67.5)
Cat bite	90(2.8)
Monkey bite	14(0.4)
Cattle	13(0.4)
wolf	5(0.2)
Pig bite	14(0.4)
Others*	30(0.9)
Total	**3226(100)**

**Include Histroy of consumption of Rabid cow's milk and contact of Human rabid patients*

Table 2: Age and sex distribution of patients attending ARV OPD, SGH Pune

Age	Male(%)	Female(%)	Total(%)
<15	615(25.1)	279(35.9)	894(27.7)
15-25	530(21.6)	116(14.9)	646(20.0)
25-35	446(18.2)	96(12.4)	542(16.8)
35-45	320(13.1)	121(15.6)	441(13.7)
45-55	235(9.6)	35(4.5)	270(8.4)
>55	303 (12.4)	130(16.7)	433(13.4)
Total	**2449(100)**	**777(100)**	**3226(100)**

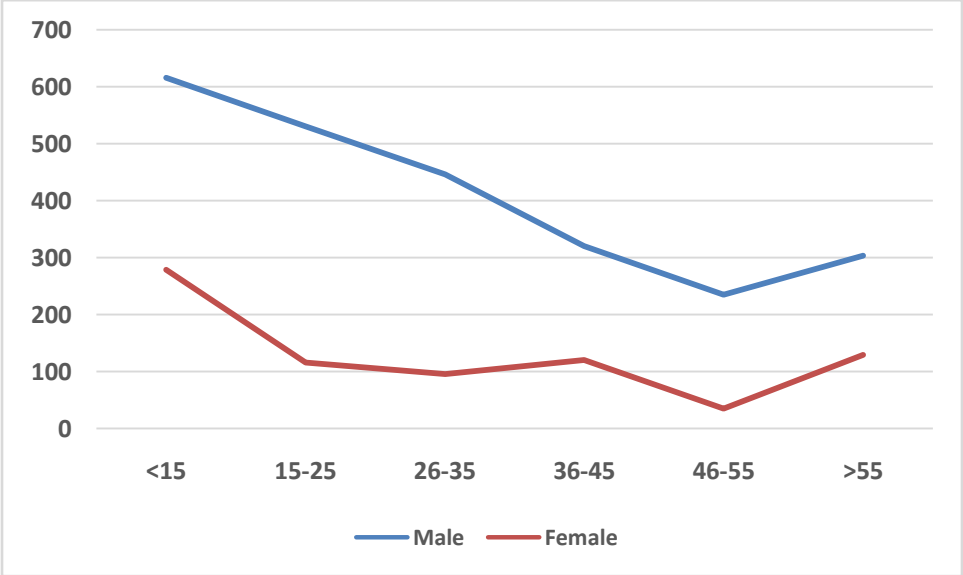

Figure 1: Age and sex trend of animal bite cases attending ARV clinic SGH, Pune

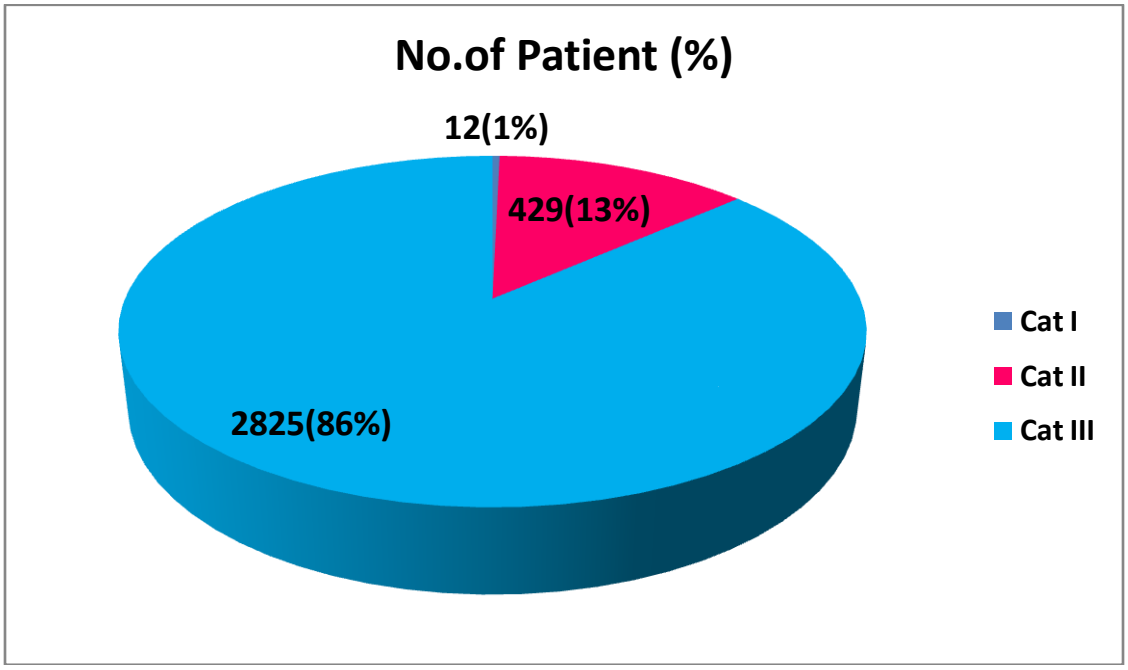

Figure 2: Classification of patients according to exposure level of animal bites

Table 3: Time lag between animal bite and patient reporting to ARV OPD

Visit of Patient to OPD	No. of patients (%)
On Same day	849(26)
Next day	947(29)
2-7 days	947(29)
8th day to <1 month	457(14)
>1month	66(2)
Total	**3266(100)**

Table 4: Measures taken Immediately after animal bite

Wound toilet after animal bite	n =3226
Wound washed immediately after bite	1089 (33.76%)
Apply Antiseptic	459 (14.22%)
Apply Indigenous product	1194 (37.01%)
Consulted doctor	40 (1.23%)
No first aid taken	**1852 (57.40%)**

**Indigenous product* – *Applying Chilli Powder, Halad and Chuna to wound site*

Table 5: Drop out of cases receiving anti rabies vaccine

ARV Vaccine ID dose	Received dose –number	Percentage (%)
1st dose	3226	100%
2nd dose	1987	61.6%
3rd dose	1810	56.2%
4th dose	710	22.2%

Even the biting animal was a pet dog, these were unimmunized dogs.

The exposure to category III animal bite in the present study was slightly higher (86%) than the studies conducted by Shah *et al.*, (67%) , Ichhpujani *et al.*, (62.6%) and Ghosh (62%) (Shah *et al.*, 2012;

Ichhapujani *et al.,* 2008; Ghosh, 1999). This could be due to the fact, Sassoon hospital being a tertiary care hospital, severe animal bite cases are referred here especially for administration of anti rabies serum.
Majority of cases did not wash their wound with water (57.40%) and another 37.01% of patients applied some indigenous products to their wound site. This is quite alarming and shows lack of knowledge and need for education regarding rabies among common people. The Findings were also similar to the study conducted by Shah *et al.,* i.e. 72.5% (Shah *et al.,* 2012).
Only 26% of patients visited the OPD within 24 hours of bite of animal. However, the findings in present study was higher than similar study conducted by Behera *et al.,* in Beharampur ,Orissa which showed only 12.6% patients visited OPD within 24 hours of exposure (Bejera *et al.,*). Drop out and reluctance to complete the anti rabies vaccine schedule was panicking and patients need to counselled and re-counselled for completing the schedule.

Conclusion

Majority of cases were children and males. The Universal Immunization Programme and Indian Academy of Paediatrics should consider including pre- exposure prophylaxis with anti rabies vaccine to children under national immunization schedule.
The people should be educated regarding the importance of wound washing and getting 1st dose of anti rabies vaccine on the same day of animal bite as it is very important and the only measure to prevent occurrence of rabies. Local and state government administration must be geared up, to reduce the load of stray dogs by catching them followed by sterilization.

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