

Title: EPIDEMIOLOGICAL DETERMINANTS OF ANIMAL BITE CASES ATTENDING THE ANTI-RABIES VACCINATION (ARV) CLINIC AT B.J. MEDICAL COLLEGE & SASSOON GENERAL HOSPITAL, PUNE, MAHARASHTRA

Author: Dr. Narwane Ganesh S1, Dr. Parande M.A.2, Dr Veenu Gayathri3

1. Assistant Professor.
2. Assistant Professor
3. Resident

Department of Community Medicine, B.J. Medical College & Sassoon General Hospital, Pune

Keywords Rabies, Epidemiological determinants, Anti Rabies Vaccination (ARV), Stray dogs

Abstract Rabies is a fatal viral zoonotic disease present on all continents with the exception of Antarctica but more than 95% of human deaths occur in Asia and Africa. India alone contributes an estimated 20000 deaths with 17.4 million exposures to animal bite occurring every year.

Original Article

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Dr. Narwane Ganesh S.¹, Dr.Parande M.A.², Dr.Veenu Gayathri³

ABSTRACT

Background: Rabies is a fatal viral zoonotic disease present on all continents with the exception of Antarctica but more than 95% of human deaths occur in Asia and Africa. India alone contributes an estimated 20000 deaths with 17.4 million exposures to animal bite occurring every year. Hence, the present study is undertaken to know the various epidemiological determinants of animal bite cases attending the ARV clinic in Sassoon General hospital, Pune.

Aims & Objectives: 1) To study profile of animal bite victims attending ARV clinic.
2) To study the various epidemiological determinants.
3) To study the seasonal variation of the cases.

Study Design: Present study is a descriptive retrospective study. Data from ARV clinic of year 2015 was analyzed using SPSS software 17 versions.

Results & Conclusions: A totals of 3912 animal bite cases attended ARV clinic in the year 2015. Majority of cases were males and nearly half (53.07%) were between 12-40 years of age. Most of them were of category III exposure 77.50% and majorities (76.76%) of them were bitten by dogs. Only 31.03% of patients visited the ARV clinic on the same day of animal bite. Nearly 30.34 % patients did not take any kind of first aid and even did not wash wound. Seasonal variation recorded maximum number of victims 476(12.77%) reported during month of June. 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.

Keywords: Rabies, Epidemiological determinants, Anti Rabies Vaccination (ARV), Stray Dogs,

INTRODUCTION

Rabies is one of the deadliest diseases of mankind. Rabies has terrified man since antiquity and continues to be a major public health problem in India. 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 world¹.

In India alone Rabies causes an estimated 20000 deaths with 17.4 million exposures to animal bite occurring every year². 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 & Africa³.

Multiple myths are associated with the disease, which vary from region to region and they determine the post exposure treatment seeking behavior of animal bite victims. It is important to know about epidemiology of animal bites 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

¹Assistant Professor, ²Associate Professor, ³Resident
Department of Community Medicine, B.J. Medical College & Sassoon General hospital, Pune.

Vaccination (ARV) clinic in B.J. Medical College and Sassoon General hospital, Pune.

AIMS & OBJECTIVES

- 1) To study profile of animal bite victims attending ARV clinic.
- 2) To study the various epidemiological determinants of animal bite cases.
- 3) To study the seasonal variation of the cases.

MATERIAL & METHODOLOGY

Descriptive retrospective cross-sectional study reviewed 3912 cases of animal bite cases which reported to the ARV clinic from 1st January to 31st December 2015 in B.J. Medical College & Sassoon General Hospital, Pune. The ARV clinic at Sassoon

Table I:
Age & Gender-wise distribution of patients attending ARV clinic

Age in Years	Gender		Total (%)
	Male (%)	Female (%)	
0-12	412 (16.75)	246 (16.94)	658 (16.82)
12-25	619 (25.16)	333 (22.93)	952 (24.34)
25-40	732 (29.76)	392 (27.00)	1124 (28.73)
40-60	468 (19.02)	284 (19.56)	752 (19.22)
>60	229 (9.31)	197 (13.57)	426 (10.89)
Total	2460 (100)	1452 (100)	3912 (100)

Table II:
Distribution of patients attending ARV clinic according to Education & Occupation.

Education/ Occupation	Number of patients (%)
Education	
Illiterate	632 (16.16)
Primary Education	883 (22.57)
Middle Education	1371 (35.05)

Table IV:
Category-wise distribution of patients attending ARV clinic

Category-wise distribution	Number of Patients (%)
Category-1	84 (2.15)
Category-2	750 (19.17)
Category-3	3032 (77.50)
PEP	46 (1.18)
Total	3912 (100)

Table V:
Time lag between animal bite and patient reporting to ARV clinic

Visit of Patient to ARV clinic	Number of patients (%)
On Same day	1214 (31.03)
Next day	1426 (36.45)
2-7 days	1089 (27.84)
8 th day to <1 month	174 (4.45)
>1 month	9 (0.23)
Total	3912 (100)

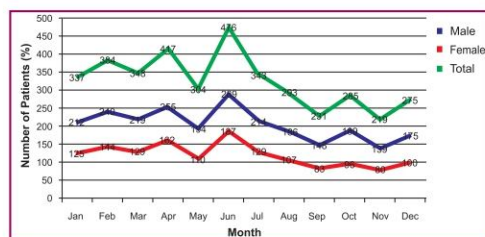
Table VI:
Measures taken immediately after animal bite.

Sr. No.	Wound toilet after animal bite	n= 3912
1	Didn't wash with water/ No first aid taken	1187 (30.34%)
2	Washed with water only	1023 (26.15%)
3	Washed with water & soap	648 (16.56%)
4	Washed with water, soap & disinfectant, apply antiseptic	589 (15.06%)
5	Apply Indigenous product	670 (17.13%)

0.1ml on each site on two arms by intra dermal route over the deltoid region. All category III patients were also administered anti rabies serum along with the vaccine as per National Rabies Guideline on Rabies prophylaxis (2015)⁴. Pre-designed and pre-tested Performa were used for Collection of data. Data was analyzed using SPSS software 17 version.

A total of 3912 patients attended ARV clinic from 1st January to 31st December 2015 and all were enrolled in the study. Findings are as followed.

Figure 1: Monthly-wise age & gender distribution of patients attending ARV clinic



Age and Sex Distribution of Patients & Seasonal trend of patients

In present study it is evident that animal bites were more commonly seen in age group of 25-40 years i.e. 1124 (28.73%) followed by 12-25 years of age i.e. 952 (24.34%). About 2/5th of cases are below 25 years i.e. it covers children & youth population. Males 2460 (62.88%) were affected more than female 1452 (37.12%) patients as per the animal bites is concerned in all age groups. Male to female ratio were 1.69: 1.[Table I]

On exploring the seasonal variation, it was found that majority of patients were in April to June season & minimum during September to November season, maximum patients were seen in June months i.e. 476 (12.17%) & minimum in November i.e. 219 (5.60%). [Figure I]

Education & Occupation wise distribution of Patients.

Nearly one in three patients attended ARV clinic had education up to middle/high school i.e. 1371(35.05%) followed by primary education 883 (22.57%) and majority had occupation as unskilled/semiskilled workers (labourer/ worker) i.e. 1573 (40.21%) followed by students 1138 (29.09%). [Table II]

Details about Animal, Animal Bite and Delay in Reporting.

Majority of patient who attended ARV clinic had history of stray dog bite i.e. 2082(53.22%) followed by pet dog 921(23.54%) & 46(1.18%) came for Pre-exposure prophylaxis [Table III]. Amongst dog & cat bite cases 1424 (41.44%) animals were observable where as 187(13.81%) animals were immunized among pet dogs & cats. Amongst all bite, 2232 (59.57%) bites were provoked and 1515 (40.43%) were unprovoked.

The patients attending ARV clinic were classified as per National Rabies Guideline on Rabies prophylaxis (2015)⁴. Majority of patients were classified as category III i.e. 3032 (77.50%) and 46 (1.18%) patients came for Pre exposure prophylaxis. [Table IV]

Around half the bites on lower limbs 2106 (53.83%) which is easily accessible to dogs/animals, followed by upper limb 996 (25.46%) and 343 (8.77%) had multiple wound. Thorax, trunk, head & neck were most common bite site in children.

As far as the reporting of animal bite were cases to ARV clinic is concerned 1214 (31.03%) of patients reported immediately on the same day of bite for treatment & nearly 1426 (36.45%) of patients attended ARV clinic the next day. The delay of more than a month was noted in 9 (0.23%) patients. [Table V]

WOUND TREATMENT AFTER ANIMAL BITE

Out of total 3912 patients, only 648 (16.56%) had washed their wounds with soap and water after the bite and 589 (15.06%) used disinfectant & antiseptic after washing. Nearly, 670 (17.13%) patients applied indigenous products like chilli powder, mustard oil and chunna, haladi & other irritant at bite site and nearly one in three of the patients 1187 (30.34%) did not take any measures after the bite of the animal. [Table VI] The ARV clinic at Sasson General Hospital also has a small bathroom for cleaning of wound as per National Rabies Guideline on Rabies Prophylaxis (2015)⁴. 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.

DISCUSSION

In this study, children and adult men were affected the most probably because of their outdoor activities. Similar finding were made in other studies too.^[5-7,11,12]

On exploring the seasonal variation it were found that majority of patients were in April to June season & least during September to November season that can be correlated with school and college vacations leading to increased outdoor activity but in study conducted by Shrinivas PJ (2015)⁹ majority of cases were reported during the months of February and March and least in the month of July- August. In study by Mohanty M et al

(2009)⁸ it was found that highest number of cases were reported during the month of January & February.

In present study about one in three patients (35.05%) had education up to middle/high school & 22.57% up to primary education. Majority victim of animal bite had occupation as unskilled workers/semiskilled workers (labourer/worker), this is probably due to outdoor activities & similar finding can correlate with study by Jahnavi R et al (2015)¹¹ where majority of patients had education up to primary 35.8% followed by secondary 27.4% and 38.5% had occupation as unskilled worker followed by semi skilled worker.

The main biting animal was stray dog and this observation is seen uniformly in other studies too^[5-7,11,12].

Category III was present in 77.50% of bite victim. This finding is similar to that of study by Jahnavi R et al (2015)¹¹ it was 82.4%, Shah V et al (2012)⁵ 67.8%, Shelke SC et al (2015)⁶ it was 86%. 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.

Around half the bites on lower limbs which is easily accessible to dogs/animals and 343 (8.77%) had multiple wound. Thorax, trunk, head & neck were most common bite site in children. Similar finding were made in other studies too.⁹⁻¹²

Only 31.03 % of patients visited the ARV clinic on same day of bite of animal or within 24 hours, similar finding can be correlated with Harish BR (2010)¹⁰ 35.1%, Shah V et al (2012)⁵ 68.3% & Shelke SC et al (2015)⁶ 26 % patients visited on same day or within 24 hours.

Majority 30.34% of victim did not even wash their wound by water and another factor which causes concern is that and 17.13% bite victims applied harmful indigenous products like chilli, Chunna and other irritant, this is quite alarming and this calls for concerned health education of people through mass media. The finding were also similar to the study conducted by Jahnavi R et al (2015)¹¹

where 25.4 % did not wash their wound & 12.2% victims applied irritants, however the study conducted by Harish BR (2010)¹⁰ majority of victims i.e. 69.8% washed their wound with water & soap.

Conclusions And Recommendations

- 1) The stray dogs were the main biting animal so prevention or control of animal bites & rabies should aim at controlling the dog population. Local and state government administration must be geared up, to reduce the load of stray dogs by catching them followed by sterilization and the ABC (Animal Birth control) strategy needs to be strengthened.
- 2) Our study revealed higher percentage of animal bites in case of children & adult male. It has much direct & indirect health implication in term of work & school absenteeism.
- 3) Majority 30.34% of victim did not even wash their wound with water, the indigenous treatment was quite prevalent and there was delay in taking treatment. This is quite alarming and all these call for concerted effort for a mass awareness campaign. The people should be educated regarding the importance of wound washing and taking anti rabies vaccine as early as possible.
- 4) In this study, only 1.18 % of patients attended ARV clinic for pre-exposure prophylaxis. This means that practice of taking pre-exposure prophylaxis is very limited and around 9(19.56%) of cases were paediatric. So 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.

LIMITATION

It is record based study so face to face interview of patients was not possible.

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