# **Original Research Article**

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20173851

# To study the treatment compliance among the animal bite patients attending anti rabies clinic in a tertiary care hospital, Solapur

Dhananjaya Chinthapatlu Desaiah<sup>1</sup>, Lokesh Kabbalu Chikkegowda<sup>2</sup>\*, Swetha Chandru<sup>3</sup>, Santhosh Munipapanna<sup>2</sup>

Received: 14 July 2017 Accepted: 04 August 2017

## \*Correspondence:

Dr. Lokesh Kabbalu Chikkegowda, E-mail: lokeshkc1984@gmail.com

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

#### **ABSTRACT**

**Background:** Rabies is 100% fatal zoonotic disease. In India majority of the disease is caused by bite of dogs, whereas bite of several other animals like cats, donkeys, monkeys, pigs, jackals and wolves can cause rabies. Post exposure prophylaxis (PEP) effectively prevents the occurrence of rabies in the exposed person. Hence the current study is done to know the treatment compliance among the patients attending Anti rabies clinic.

**Methods:** It is hospital based longitudinal study. Data was collected through personal interview from January 1<sup>st</sup> 2013 to December 31<sup>st</sup> 2013 and clinical examination was done. All patients were registered and were given first dose of ARV at the time of registration and advised to take all the remaining doses as per schedule. Data regarding their compliance for completion of vaccination schedule was analyzed. Statistical analysis was done by using simple proportions and percentages.

**Results:** Out of 7205 patients, 5343 (74.15%) patients completed second dose, 5021 (69.68%) patients completed third dose and 2998 (41.6%) patients completed fourth dose of intradermal schedule of rabies vaccination and antirabies immunoglobulins were advised for 1536 patients among them 1180 (76.82%) patients took immunoglobulins.

**Conclusions:** Most of the patients are not completing ARV intradermal schedule. Hence the animal bite patients should be motivated effectively through health education by interpersonal communication at the time of initiation of vaccination course about timely and complete administration of anti - rabies vaccination to attain the goal of Rabies free India.

Keywords: Intradermal, PEP, ARV, Compliance

## INTRODUCTION

The word 'Rabies' has been derived from the Sanskrit word 'RABHAS' which means "to do violence". Another group believes it to be originated from Latin word 'REBERE' which means 'to rave' meaning talking irrelevantly (delirium). The disease is also known as 'JALASANTHRA' which means agony cause by water. Rabies also known as hydrophobia is an acute, highly

fatal viral disease of the central nervous system, caused by lyssa virus type 1. It is primarily a Zoonotic disease of warm blooded animals, particularly carnivorous such a dogs, cats, jackals and wolves. It is transmitted to man usually by bites or licks of rabid animals. It is characterized by long and variable incubation period, a short period of illness due to encephalomyelitis ending in death. It is the only communicable disease of man that is always fatal. Rabies occurs in more than 150 countries

<sup>&</sup>lt;sup>1</sup>Department of Pediatrics, The Oxford Medical College and Research Centre, Bangalore, Karnataka, India

<sup>&</sup>lt;sup>2</sup>Department of Community Medicine, <sup>3</sup>Department of Biochemistry, MVJ Medical College and Research Hospital, Bangalore, Karnataka, India

and territories. Although a number of carnivorous and bat species serve as natural reservoir, rabies in dogs is the source of 99% of human infection and possess a potential threat to more than 3.3 billion people. In India, 20000 deaths are estimated to occur annually. All the age groups are susceptible, rabies is most common in children aged <15 years. On an average 40% of post exposure immunization are given to children aged 5-14 years, and the majority of those immunized are males. At the global level more than 15 million people rabies prophylaxis annually; the majority of whom live in China and India. It is estimated that, in the absence of post exposure prophylaxis, about 3.27 Lakh people die from rabies in Africa and Asia each year.<sup>2</sup>

Prevention of rabies is possibly by providing the exposed person with the proper post exposure prophylaxis (PEP), PEP in rabies exposed persons includes wound toilet, post exposure vaccination, and administration of rabies immunoglobulin.<sup>3</sup> The Indian Government has adopted its 'National Guidelines for Intra dermal Vaccination' from World Health Organization guidelines. IDRV requires a smaller quantity of vaccine to be injected into the skin. It is 60–80% cheaper than vaccination by intramuscular route. IDRV is also expected to increase the compliance due to lesser number of visits and decreased cost of the regimen.<sup>4</sup>

The cell culture vaccines are more potent and much safer than the conventional brain tissue vaccines, which are not used now. Various CCVs have been approved for uses which are Purified Vero Cell Vaccine (PVCV), Purified Chick Embryo Cell Vaccine (PCECV), Human Diploid Cell Culture Vaccine (HDCV), etc.<sup>5</sup>

The study was conducted in civil hospital Solapur (Dr V M Government Medical College) for the period of one year from Jan1st 2013 to Dec 31st 2013. In this hospital vaccination is given through intra dermal schedule in majority of the cases (Cat II and Cat III animal bites) except in immunocompromised people in which intramuscular is followed. The current study was done to assess the treatment compliance among the patients attending ARV clinics.

#### **METHODS**

It is hospital based longitudinal study. Data was collected through personal interview from January 1<sup>st</sup> 2013 to December 31<sup>st</sup> 2013 and clinical examination was done during OPD hours from 9-12 noon and during Sunday and other government holidays between 9-10 am in ARV clinic.

Animal bite cases were classified using WHO guidelines.<sup>6</sup> As per this classification, category II and III patients have risk of getting rabies and require post exposure prophylaxis (PEP) of ARV and/or immunoglobulin. Only these patients were included in the study. All patients were registered and was given first dose of ARV at the time registration and advised to take

all the remaining doses as per the schedule without fail on 3rd, 7th and 28th day to complete the 4 dose intra dermal schedule.

The patients who went to other centers or referred to other centers for subsequent doses after registration were excluded from the study. Also patients came for pre exposure and re exposure cases were not included.

Records of all such patients were studied and data regarding their compliance for completion of vaccination schedule was analyzed. Data was entered in Microsoft excel sheet and it was analyzed with Epi info software. Statistical analysis was done by using simple proportions and percentages. Throughout the study anonymity of all patients was maintained and privacy as well as confidentiality of the data was assured.

#### **RESULTS**

In our study total number of animal bite cases registered in ARV clinic for the year 2013 were 7205, out of those majority were male patients (5213) i.e. 72.35% and female patients were 1992 i.e. 27.65%. Around 4200 (58.29%) belonged to urban area and remaining 3005 patients (41.7%) belonged to rural area.

Table 1: Category wise and residence wise distribution of (animal bites) cases.

Category wise distribution of (animal bites) cases				
Sex	<b>Male</b> (%)	Female (%)		
Cat1	79 (1.52)	33 (1.65)		
Cat2	4069 (78.05)	1488 (74.70)		
Cat3	1065 (20.42)	471 (23.64)		
Total	5213	1992		
Residence wise distribution of cases				
Residence	Cases	<b>%</b>		
Urban	4200	58.29		
Rural	3005	41.71		
Total	7205	100.00		

Majority of the patients were bitten by dogs 72.27%, (5240), and cats 17.27% (1245), we also had patients bitten by other animals like donkeys (3.3%), monkeys (1.7%), pigs (2.4%), cows (1.26%), horse (0.6%) and exposure to rabies patient (0.59%).

Among male patients, majority of them were diagnosed as Cat II patients (4069) i.e. 78.05%. Cat III patients were 1065 (20.42%) and 79 patients i.e. 1.52% were categorized as Cat I.

Majority of the female patients belonged to Cat II (1488 i.e. 74.70%), around 471 (23.64%) were categorized as Cat III and rest were Cat I (33 i.e. 1.65%).

Only 21.52% patients came for medical treatment (post exposure prophylaxis) immediately or within 24 hours.

Bulk of the patients delayed treatment or medical advice till 3 days (54.64%).

Around 17.29% of the patients came between 4<sup>th</sup> and 10<sup>th</sup> day and around 5.48% of the patients came after 10<sup>th</sup> day to seek medical advice.

Table 2: Duration between exposure and treatment and doses completed as per the intradermal anti rabies vaccine schedule.

<b>Duration between exposure and treatment</b>		
Duration Duration	Cases	%
Within 1 day	1578	21.9
Within 1 to 3 days	3987	55.34
Within 4 to 10 days	1245	17.28
More than 10 days	395	5.48
Total	7205	100.00
Doses completed as per the ID ARV schedule		
ID ARV schedule	Cases	%*
2nd dose completed	5343	74.15
3rd dose completed	5021	69.68
4th dose completed	2998	41.60

<sup>\*</sup>percentages calculated on total no. of cases

Table 3: Distribution of category III patients based on anti rabies immunoglobulins taken.

Category III patients	Cases	%
Equine anti rabies immunoglobulins taken	1180	76.82
Anti rabies immunoglobulins not taken	356	23.18
Total category III patients	1536	100.00
Hypersensitivity developed	63	5.34**
Human immunoglobulins taken	3	4.76***

<sup>\*\*</sup> Percentage calculated out of total Anti Rabies Immunoglobulins taken 1180 cases

Table 4: Distribution as per biting animals.

Biting animal	Cases	%
Dog	5240	72.27
Cat	1245	17.27
Monkey	123	1.7
Donkey	241	3.3
Pig	174	2.41
Horse	46	0.6
Cow	91	1.26
Expose to rabies patient	43	0.59
Total	7205	100

Out of 4 doses of anti-rabies Intradermal vaccination schedule (0, 3, 7, 28), 2<sup>nd</sup> dose was taken by 5343 (74.15%) only and 3<sup>rd</sup> dose was completed by 5021 patients (69.68%). All the 4 doses were completely taken only by 2998 patients (41.6%). Among these patients those who have taken all the 4 doses, only 1235 (41.27%) completed the schedule in time. The rest of the patients (1758 i.e. 58.73%) did not complete the schedule in time.

Out of total number of patients, Cat III patients were 1536 and all were advised to take immunoglobulins (equine anti-rabies serum) along with Post Exposure Prophylaxis. But only 1180 patients took

immunoglobulins. The remaining 356 patents ignored to take immunoglobulins, may be due to unavailability of free immunoglobulins in hospital and the high cost of the immunoglobulins.

Among 1180 patients those who took immunoglobulins (equine anti-rabies serum) 63 developed hypersensitivity reactions for the test dose of equine anti-rabies serum; for all these patients, we advised human anti-rabies serum. But only 3 patients out of 63 could afford to take human anti-rabies serum, mostly due to very high cost of human anti-rabies serum.

<sup>\*\*\*</sup> Percentage calculated out of total hypersensitivity developed 63 cases

#### **DISCUSSION**

The present study was carried out to assess treatment compliance among the patients attending Anti Rabies clinic. In this study total number of registered cases were 7205, out of which male patients were majority in numbers 5213 (72.35%) and female patients were 1992 (27.65%), major number of cases came from urban area (58.29%) when compared to rural area (41.71%) may be because more outdoor activity of males as compared to females and urban location of ARV centre where the study was conducted respectively. Similar findings were noted by other researchers like Bariya, Patel, Shringarpure, et al, male patients (70.8%), female patients (29.2%) majority of patients residing within 3-5 km distance from Anti Rabies clinic.<sup>5</sup> Study done by Sudarshan et al showed males were more affected (68%) than female (31.7%), the bite incidence was slightly more in rural areas than urban areas.<sup>7</sup>

In our study maximum number of patients came to seek medical advice within three days after the bite has occurred that is around (55.34%), within one day (21.9%), within 4-10 days (17.28%), after 10 days (5.48%). In a study done by Karmakar et al profile and management of animal bite cases at Malda, also showed similar results, delay more than 7 days (14%), The number of people coming very late to the clinic (more than 72 hours) increased with increasing distance from the clinic but a considerable number of patients living within 10 kms (11% patients) came very late. Study done by Sridhar et al also gave similar findings, (43.6%) victims reported on the same day of bite and 576 (33.4%) reported on the next day.

In present study many number of patients completed 2<sup>nd</sup> dose of (intradermal anti rabies vaccine) ID ARV dose (74.15%), 3<sup>rd</sup> dose was completed by (69.68%), and the compliance for all four doses was only (41.60%). Similar findings was given by the study done by Vinay et al, 53.2% completed the prescribed four dose schedule. Out of the 4264 patients 852 (20.0%) completed 3 doses and did not receive the fourth dose. <sup>10</sup> 11.5% of the 4264 patients received only two doses. 654 (15.3%) out of the 4264 patients received only the first dose and did not turn up for the follow up visits. <sup>10</sup> Study done by Romero-Sengson at Philippine Children's Medical Center, came up with similar findings, 2<sup>nd</sup> dose completed by (71%), 3<sup>rd</sup> dose completed by (57%), and all 4 dose completed by only (22%). <sup>11</sup>

In our study category III patients were 1536, all the patients were prescribed to take anti rabies serum (immunoglobulin's), but only 1180(76.82%) took anti rabies serum, rest of the category III patients around 356(23.18%) did not take anti rabies serum. Similar study findings was given by the study done by Sridhar, et al. 1133 children who had category III bites were advised for rabies immunoglobulin administration. Of these 443 (39.1%) received it. Study done by Karmakar et al, only

one out of the 61 category III bites patients, received rabies immunoglobulin; reasons being unavailability of rabies immunoglobulins and the high cost of the immunoglobulins.<sup>8</sup>

#### **CONCLUSION**

In the present study the compliance for all the 4 doses of intradermal anti rabies vaccine was found to be only 41.6% which is considered to be extremely low for this highly fatal disease. Reasons for the low compliance may be due to lack of awareness of this serious disease, patients might have forgotten the dates of schedule, wound might have healed before completing the dose, they may lose daily wages, they may go to their home town. Hence the animal bite patients should be made aware of the fatality of the disease and motivated effectively through health education by interpersonal communication with the use of information, education and communication materials at the time of initiation of vaccination course about timely and complete administration of anti - rabies vaccination to attain the goal of rabies free India.

#### Recommendation

Counseling of the patients regarding the importance of completing the 4 dose intradermal schedule to prevent fatal outcome of the disease, Community awareness to seek medical treatment as early as possible after animal bite and follow up of patients by mobile tracking system. ARS- at least equine ARS should be made available free of cost to every category III animal bite cases in government hospital; for the better compliance.

#### **ACKNOWLEDGEMENTS**

The authors acknowledge the Heads of the Institutions, Postgraduate colleagues, Internees, Statistician and also the support and cooperation extended by the participants who are part of this study.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approval.

Ethical approval: The study was approved by the

Institutional Ethics Committee

#### REFERENCES

- 1. Suryakantha AH. Community Medicine with recent advances. 4th Edition. Chapter 20. Epidemiology of Communicable diseases. New Delhi: Jaypee The Health Sciences Publishers; 2017: 521.
- Park K. Textbook of Preventive and Social medicine. 23rd edition. Epidemiology of Communicable diseases, Zoonoses, Rabies. Premnagar, Jabalpur: Banarsidas Bhanot publisher; 2015: 276.
- 3. Domple VK, Doibale MK, Sonkar VK, Aswar NR, Khadilkar HA, Jain SR, et al. Treatment compliance

- of self-reported dog bite cases attending outpatient department of Tertiary Care Hospital, Maharashtra; Int J Med Public Health. 2015;5(4):297-300.
- Bharti OK, Damme WV, Decoster K, Isaakidis P, Appelmans A, Ramachandran V, et al. Breaking the Barriers to Access a Low Cost Intra-Dermal Rabies Vaccine through Innovative "Pooling Strategy". World J Vaccines. 2012;2:121-4.
- 5. Bariya B, Patel S, Shringarpure K, Mazumdar V. Compliance of Animal Bite Patients Managed by Intramuscular Route of Anti-rabies Vaccination. RRJoI. 2015;4(2):1-7.
- 6. WHO. WHO Expert Consultation on Rabies. World Health Organ Tech Rep Ser. 2005;931:1-88.
- Sudarshan MK, Mahendra BJ, Madhusudana SN, Gangaboraiah. An Epidemiological study of animal bites in India. Results of a WHO sponsored national multi centric rabies survey. J Commun Dis. 2006;38(1):32-9.
- 8. Karmakar A, Bhattacharya A. Epidemiology of Animal Bites with Special Reference to Post-exposure Prophylaxis of Rabies in and Around Malda, West Bengal: A Hospital-based Study. Int J Cur Rev. 2017;9(10):19-22.

- Sridhar PV, Shanmukappa, Vinay M, Anil Kumar K. Profile of children bitten by dogs, reporting to a government tertiary care hospital and their compliance to post exposure prophylaxis. JEMDS. 2014;3(43):10673-8.
- Vinay M, Mahendra BJ, Goud N, Kumar A. Sociodemographic characteristics affecting compliance to intra dermal rabies vaccination at anti rabies clinic in a Government tertiary care hospital in Karnataka. J Evol Med Dent Sci. 2013;2(37):7092-7.
- 11. Romero-Sengson RF. Philippine children's medical center: factors affecting compliance to rabies post-exposure prophylaxis among pediatric patients seen at the research. Institute Trop Med. 2013;14(2):56-62.

Cite this article as: Desaiah DC, Chikkegowda LK, Chandru S, Munipapanna S. To study the treatment compliance among the animal bite patients attending anti rabies clinic in a tertiary care hospital, Solapur. Int J Community Med Public Health 2017;4:3394-8.