

Pre-treatment practices among animal bite victims attending anti-rabies clinic at a tertiary hospital, Bengaluru: A cross-sectional study

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ABSTRACT

Context/Background

Rabies is a neglected, vaccine-preventable, zoonotic tropical disease caused when the saliva of an infected animal comes in contact with human mucosa or skin wounds. Dog bites account for up to 99% of all human cases of rabies. Immediate, thorough wound washing with soap and water after contact with a suspected rabid animal is crucial and can save lives. Pre-treatment practices, such as application of irritants are being practiced among the bite victims.

Aims/Objectives

Assessing the Pre-treatment practices among animal bite victims seeking treatment at Anti-Rabies Clinic.

Methodology

The cross-sectional study was carried out among 330 participants over a period of three months, among animal bite victims attending the Anti-Rabies Clinic, Victoria hospital, Bengaluru, using the Purposive Sampling method. The data were collected using pre-tested, semi-structured questionnaire, which was entered into an excel sheet, and analysed using SPSS.

Results

In this study, there were 330 participants, with 73.9% participants being males and 26.1% being females. 63.3% patients reported washing the wound site with soap and water. A statistically significant association was found between gender and education in relation to the application of antiseptics and irritants

Conclusions

It was observed that there were Pre-treatment practices such as application of irritants, antiseptics, wound dressing, and inadequate wound washing among the animal bite victims.

Key-words: Rabies; Tropical disease; Postexposure prophylaxis; Anti-Rabies Vaccine

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Conflict of Interest—none | Ethical Clearance - Approved

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Rabies is a vaccine-preventable zoonotic viral disease caused by lyssavirus infection belonging to Rhabdoviridae family and affecting Central Nervous System (CNS). It leads to tens of thousands of deaths every year, mainly in Asia and Africa, 40% of whom are children under 15 years of age.¹⁻² Almost all warm-blooded animals are susceptible to rabies lethal encephalomyelitis.³ Dogs are the main source of human rabies deaths, contributing up to 99% of all rabies transmissions to humans and transferred through bites, scratches, or direct contact with mucosa, and spreads to both humans and animals via saliva.¹ Following a potential rabid animal exposure, Post-Exposure Prophylaxis (PEP) is advised, which includes immediate, thorough wound washing with soap and running water for 15 minutes, Anti-Rabies Vaccination, and, if indicated, administration of Rabies Immunoglobulin or monoclonal antibodies, which can be life-saving.¹ According to estimates, the Southeast Asian Region accounts for around 45% of all rabies-related fatalities worldwide.⁴

Globally, there are approximately 59,000 human rabies deaths per year, with the majority occurring in Africa (36.4%) and Asia (59.6%).⁵ Rabies is endemic in India except Andaman & Nicobar and Lakshadweep islands. Worldwide, India has the largest numbers of stray dogs. Unvaccinated dogs form a huge number, putting Indians at high risk of contracting rabies.⁶ The Global Rabies Conference has set a target of eliminating dog-mediated rabies human deaths by 2030. This can be achieved by ongoing, extensive public awareness efforts regarding acceptable health-seeking behaviour following animal bites, adequate animal bite wound care, and vaccine programmes.⁶

Rabies is a Neglected Tropical Disease (NTD) that primarily affects the already marginalised, and vulnerable. Simple preventive actions, such as washing wounds with soap and running water make major impact in lowering rabies fatalities.⁷ In terms of wound care, studies have indicated that the majority of patients used home remedies prior to reaching the hospital, particularly the application of a chilly oil paste.⁸ Such practises not only worsen the wound but also delay in seeking appropriate care. Although effective human rabies vaccinations and immunoglobulins exist, they are not easily accessible to those in need.¹

Rabies can be prevented through mass vaccination of dogs and prevention of dog bites.¹ Once the disease manifests clinically, there is no effective treatment. It is a 100% fatal, 100% vaccine-preventable.⁹ Nevertheless, rabies can be significantly reduced if animal bites are treated promptly. Post-exposure management of animal bite cases is critical. The cornerstones of rabies prevention are wound care, immunisation, and immunoglobulin injection.¹⁰ This study aims at assessing the Pre-treatment practices among animal bite victims seeking treatment at Anti-Rabies Clinic.

Methodology

The study was conducted in Anti-Rabies Clinic (ARC) of Victoria Hospital which is attached to Department of Community Medicine, Bangalore Medical College and Research Institute, Bengaluru. In this clinic the Updated Thai Red Cross regimen was followed, where Anti-rabies vaccine (ARV), the Cell Culture Vaccines (CCV) were given as Post-Exposure Prophylaxis (PEP) 0.1ml (4 IU) each, intradermal (ID) over both the deltoids as four-doses on 0, 3, 7 and 28 days for patients who were receiving ARV for the first time, two-dose regimen at 0 and 3 days, 0.1ml (4 IU) ID over one deltoid was employed for previously vaccinated (Re-exposure) cases and three-dose regimen 0.1 ml (4 IU) ID at 0, 7 and 28 days for Pre-Exposure Prophylaxis (PrEP) was given¹¹. The study was carried out for 3 months from November 2022 to January 2023, among animal bite victims visiting ARC, after obtaining approval and clearance from the Institutional Ethics Committee, Bangalore Medical College and Research Institute, Bengaluru (Ref: BMCRI/PS/199/22-23 dated on 21st October, 2022).

The animal bite victims visiting ARC were approached, data was collected using a pre-tested, semi-structured and validated questionnaire by interview method after obtaining informed consent or assent. The animal bite victims were selected based on Purposive Sampling until the sample size of 330 was reached [8]. The questionnaire consisted of sociodemographic details, details of the animal bite and about the animal, wound treatment practices before approaching healthcare facility, wound description, previous animal bite history and



its treatment, and current treatment details. Animal bite victims attending Anti-Rabies Clinic, Victoria Hospital, willing to provide informed consent or assent were included in the study. Category 1 bite victim/s and victim/s of rodent bites were excluded from the study. Operational definition of Pre-treatment practices: The wound care practices followed by the patients who were exposed to animal bite before reaching the study health facility and seeking the treatment.

Results Original Articles

Socio-demographic profile among Animal Bite Victims: In the study, a total number of 330 participants were included where 73.9% Participants were males and 26.1% were females. Table 1 depicts the socio demographic profile among the animal bite victims. A greater number of people belonged to the age group of 15-59 years, constituting 66.4%.

Table 1: Distribution of Socio-demographic profile among Animal Bite Victims (n=330)

Sociodemographic variable		Frequency n (%)
Gender	Female	86 (26.1)
	Male	244 (73.9)
Age	<5 years	26 (7.9)
	5-14 years	78 (23.6)
	15-59 years	219 (66.4)
	>60 years	7 (2.1)
SES as per Modified Kuppaswamy 2022	Upper (I)	Nil
	Upper Middle (II)	74 (22.4)
	Lower Middle (III)	159 (48.2)
	Upper Lower (IV)	97 (29.4)
	Lower (V)	Nil
Educational Status	Graduate	60 (18.2)
	Intermediate or Diploma	44 (13.3)
	High School Certificate	97 (29.4)
	Middle School Certificate	64 (19.4)
	Primary School Certificate	36 (10.9)
	Illiterate	29 (8.8)

Distribution of biting animal characteristics among animal bite victims:

Out of 330 participants, it was observed that 281 (85.2%) were bitten by dog, 43 (13%) were bitten by cat and 6 (1.8%) by monkey. Majority of animal bite victims claimed that the bites were due to stray animals 248 (75.2%), followed by pet 76 (23%) and wild 6 (1.8%). The most common sites involved was lower limb 185 (56.1%) and upper limb 118 (35.7%) (in case of multiple sites, the site nearer to CNS is considered). It was observed that majority of the

animal bites were of category III 268 (81.2%) followed by category II 62 (18.8%). Only 74 (22.4%) animal bite victims had history of previous animal bite. Among 330 participants, 209 (63.3%) patients washed the wound site which soap and water, 103 (31.2%) subjects washed with water alone and the wound wash was not done in the remaining 18 (5.5%) people. When interviewed about the application of antiseptics and irritants, majority 117 (35.5%) of them had applied only irritants, both antiseptics and irritants application among 82

(24.8%) subjects, 55 (16.7%) claimed that they applied antiseptics only, and only 76 (23%) participants did not apply anything. Dressing over the wound was present among 38 (11.5%) participants. Majority of the bites were provoked 238 (72.1%). It reveals that majority of them sought

treatment from Government facility 285 (86.4%) after the animal bite followed by Private Clinics/ Hospitals 37 (11.2%) and least went to Traditional healers 8 (2.4%) post animal bite. The various antiseptics application among animal bite victims have been described in Table 2.

Table 2: Different antiseptic application among animal bite victims (n=137)

Antiseptics	Frequency n (%)
Alcohol based sanitizer	26 (19)
Antiseptic ointment (eg. betadine)	28 (20.4)
Antiseptic liquid (eg. Iodine, Tincture, Surgical spirit, Dettol, Savlon)	83 (60.6)

The different irritants application have been mentioned in the Table 3.

Table 3: Various irritants application among animal bite victims (n=209)

Irritants	Frequency n (%)
Chilli powder	4 (1.9)
Coconut oil	24 (11.5)
Coffee powder	25 (12)
Jackfruit paste	23 (11)
Limestone powder	64 (30.6)
Talcum powder	8 (3.8)
Turmeric	38 (18.2)
Others (Wood ash; Boric acid powder; Ink; Vicks; Mineral oil)	23 (11)

The Association between Sociodemographic variables and Pre-treatment practices among animal bite victims is depicted in Table 4. The application of irritants is found to be more among males (67.9%). There is an association between gender and application of irritants and this is found to be statistically significant ($P = 0.0001$). Also, there is an association between Education and application of antiseptics which is statistically significant

($P=0.0123$) i.e., the antiseptics application is least seen among the participants who are illiterates. Similarly, there is an association between education and application of irritants and this is statistically significant ($P < 0.0001$). Application of irritants was seen more among Lower middle (47.4%) and Upper lower (39.2%) Socio-economic groups. There is an association between application of irritants and Socio-economic status and this is found to be statistically significant ($P < 0.0001$).

Table 4: Association between Sociodemographic variable and Pre-treatment practices among animal bite victims (n=330)

Gender	Pre-treatment practices							
	Wound wash		Application of antiseptics		Application of Irritants		Wound dressing	
	Yes	No	Yes	No	Yes	No	Yes	No
Male	231	13	96	148	142	102	26	218
Female	81	5	41	45	67	19	12	74
	$\chi^2=0.029$, P = 0.8647		$\chi^2=1.8118$, P = 0.1783		$\chi^2=10.6056$, P = 0.0001		$\chi^2=0.6766$, P = 0.4107	
Education								
Graduate	58	2	32	28	25	35	4	56
Intermediate or Diploma	41	3	19	25	23	21	5	39
High School Certificate	94	3	33	64	61	36	8	89
Middle School Certificate	62	2	23	41	58	6	9	55
Primary School Certificate	33	3	22	14	21	15	5	31
Illiterate	24	5	8	21	21	8	7	22
	$\chi^2=10.7959$, P=0.0556		$\chi^2=14.5767$, P=0.0123		$\chi^2=36.4003$, P=< 0.0001		$\chi^2=7.5434$, P=0.1833	
Socio-economic status								
Upper Middle (II)	68	6	32	42	28	46	5	69
Lower Middle (III)	151	8	66	93	99	60	24	135
Upper Lower (IV)	93	4	39	58	82	15	9	88
	$\chi^2=1.3987$, P=0.4969		$\chi^2=0.1595$, P=0.9234		$\chi^2=39.5700$, P=< 0.0001		$\chi^2=4.1198$, P=0.1275	

DISCUSSION

In the present study, most of the participants were males (73.9%) and belonged to the age group 15-59 years, similar to the studies conducted by Salve et al., and Sachdeva et al.^{8,10} Majority of them were from Lower Middle and Upper Lower SES, when compared to the systematic review by John et al

where majority of them belonged to Upper Lower and Lower SES.¹² The participants educated till High School were more when compared to other categories, when compared to study by Sivagurunathan et al., where participants were educated up to Higher Secondary Certificate (HSC)

or lower.⁶ In the study the dog was the major biting animal (85.2%) similar to the studies by Sachdeva et al., Sudarshan et al., Haradanhalli et al and Gogtay et al.^{10,13-15} Most of the bites were due to stray animals (75.2%) followed by pet (23%) and wild (1.8%), findings similar to the study by Sachdeva et al.¹⁰ Lower limbs were the most frequently bit, followed by upper limbs. This finding is similar to the studies by Salve et al., Sudarshan et al. and Ngugi et al.^{8,13,16} Majority of the bites were of Category III followed by Category II similar to the study by Gogtay et al.¹⁵ Most of the bites were following provocation (72.1%) when compared to the study by Sachdeva et al. where unprovoked bites were maximum (78.7%).¹⁰

Pre-treatment practices such as application of antiseptics and irritants were seen among 41.5% and 60.3% of the study subjects. This can be compared to the study conducted by Salve et al., where 69.8% of the participants had followed Pre-treatment practices such as applying chilly oil paste (54.6%) and application of antiseptics (4%).⁸ Out of 94.5% of the participants who had washed their wounds before reaching hospital, 63.3% of them washed with water and soap, and remaining 31.2% washed their wounds with water alone when compared to study by Haradanhalli et al. where 25.1% of the participants washed only with water, 38.4% with water and soap, 32.9% did not wash their wounds, remaining 3.6% of them were not sure of wound wash.¹⁴ In the present study, most common antiseptic used was antiseptic liquid (60.6%) followed by antiseptic ointment (20.4%) and alcohol based sanitizer (19%). Most common irritant used was found to be limestone powder (30.6%) followed by turmeric (18.2%), Coffee powder (12%) and other irritants. These findings can be compared to the previous study by Haradanhalli et al.¹⁴

In the current study, there is an association between gender and application of irritants and this is found to be statistically significant ($P = 0.0001$). There is an association between education and application of antiseptics which is statistically significant

($P=0.0123$). Also, there is an association between education and application of irritants and this is statistically significant ($P<0.0001$). Similarly, there is an association between application of irritants and Socio-economic status and this is found to be statistically significant ($P<0.0001$).

CONCLUSION

For animal bites, ideally all that is needed is a simple soap and water wound wash. In the present study, there were multiple pre-treatment practices among the participants such as application of antiseptics and irritants without proper wound treatment following animal bites. Majority of them were males in the study and the subjects were between the ages of 15 and 59. The purpose of the study was to assess these pre-treatment practices among the victims of animal bites. Application of irritants was found to be significantly associated with the gender, educational status and socio-economic status. Health education about do's and don'ts of managing animal bite wounds, spreading awareness among the general public about rabies and its preventive measures, as well as how to manage animal bites at home and in hospitals, using relevant Information Education Communication (IEC) materials can be helpful. Additionally, the animal bite victims should be explained about the complete anti-rabies vaccine schedule and its importance

LIMITATIONS

The findings may not be applicable to the general population, since the study was conducted in the hospital. Few patients who would have practiced Pre-treatment methods would have been missed, as Purposive sampling was used for data collection.

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