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Practices Related to Post-Exposure Prophylaxis of Rabies in Animal Bite Cases: A Clinic-Based Study from a Tertiary Care Hospital, west Bengal.

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Abstract: *Rabies is a potentially fatal disease transmitted by bite of infected animal, primarily dogs. India remains endemic for this disease contributing to about 20000 deaths due rabies yearly. However, simple preventive practices are sufficient to protect against this deadly disease. The current study aimed at identifying the reported burden of animal bite cases, their categorization and practices related to preventive measures. The study was conducted by interviewing patients attending the Anti-Rabies Vaccination (ARV) clinic. Patients were mainly male and Hindu, attending clinic with predominantly incidence of dog bite, category 3 exposure being observed in majority. Though not cent per cent, still majority performed wound wash with soap and water before attending the clinic. Among the category 2 & 3 exposure patients only 64.8% patients attended clinic for starting ARV within a day of exposure. Majority completed the schedule but 29.5% did not. Of those who had their ARV schedule incomplete 75.0% did not take the fourth (final) dose. The study concluded with the fact that, rigorous awareness campaigns are needed in urban areas on the backdrop of "zero by 30" goal.*
Keywords: *Animal bite, dog bite, post-exposure prophylaxis, rabies, rabies prevention.*

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I. Introduction

Rabies is a fatal disease that occurs in human beings after bite or exposure to animals infected with rabies virus, a deadly Lyssa virus. Rabies is prevalent in over 150 countries in the world.[1] Rabies being a fatal disease, prevention remains the key concept. Though any animal (mammalian) bite can cause transmission of rabies virus to the human beings, dogs remain the major source with a contribution of 99% for transmission of human rabies[1]. Though transmission of rabies via animal bite is a global phenomenon, still Asian and African regions remain in the focus.[2] Around 40% of those bitten by a suspected rabid animal are children as reported by the World Health Organization.[1] In India it is estimated that around 18,000 to 20,000 people die from rabies each year, yet the true burden remain unknown.[2,3]

The Global Alliance for Rabies Control (GARC) in collaboration with World Organization for Animal Health, Food and Agriculture Organization and World Health Organization have put forward the global strategic plan "Zero by 2030" to reduce the human deaths from rabies to zero by the year 2030.[4,5] In India as well the movement has taken off with the call to unite for a zero-rabies mission.[6] The effort for prevention of rabies infection and transmission is in really a challenge complicated by the fact that it is not a notifiable disease and thus lack in a structured surveillance for animal and human rabies. It is well understood that rabies is extremely fatal supported by the meagre number of only 15 survivors globally till date[7], nevertheless completely preventable by effective and efficient public health intervention, vaccination. Both pre-exposure prophylaxis and post-exposure prophylaxis are available. Post-exposure prophylaxis (PEP) is considered of monumental importance, especially in the Indian context where dog population itself is nothing but huge. However, the simpler pre-requisites like washing of wounds immediately and attending Anti-Rabies Vaccination (ARV) clinic as early as possible are of immense importance and can be life-saving at times[1] in cases of post-exposure treatment.

In India, the Thai Red Cross regimen (intra-dermal) is followed for prophylaxis[8]. However the importance of completion of the schedule is often ill-conceived and neglected[9,10]. The present study aims at describing the types and categories of animal bites/exposures among the patients attending the ARV clinic, their basic practices and compliance in treatment.

II. Materials & Methods

A study was performed on the patients attending the Anti-Rabies Vaccination Clinic (ARV clinic) of Medical College & Hospital Kolkata from the period of March to June, 2017. Data were collected from the patients who were started on ARV from the clinic during the mentioned period. However the patients who did not come from the geographical region of Kolkata were excluded. The socio-demographic variables like patients' age, gender, religion were considered as background information. The date of exposure/bite, biting animal, body-region of bite, date of attending clinic, whether equine rabies immune-globulin (ERIG) given or not, dates of four doses of ARV taken were also considered for analysis. In addition to all these status of wound washing immediately or prior to attending clinic and category of exposure were also enquired to individual patients. Delay in starting ARV was calculated from the date of first dose & date of exposure. If the patient started ARV within 24 hours of bite (or on the same day) the delay was computed as 0 day or no delay, if it was after 24 hours but not more than 48 hours (or on the next day) it was regarded as delayed by 1 day. Next, schedule completion was analyzed. Subsequently those who did not complete all the four doses as per schedule, were considered to not have completed ARV. Now, among them the non-completion of fourth, third and second dose(s) were analyzed. The results has been represented in terms of frequencies and percentages through frequency distribution tables, bar charts and histograms.

III. Results

The mean age of the patients who attended the ARV clinic was 37.20 years (standard deviation: 18.42 years). While infants attended the clinic following animal bite, the oldest person attending the clinic was 85 years old. (Fig. 1) Out of the 193 records analyzed, 76.7% of the patients were male. Majority (78.2%) were Hindu with rest belonging to Islam. (Table 1)

Distribution of the patients as per classification of animal bite/exposure has been presented in Table 2. Majority (71.0%) of the patients attended the clinic with dog-bite. Cat-bite was there among 24.4% of the patients. Another 1.6% had monkey-bite, 0.4% got bitten by horse, while 2.6% reported rat-bite. Exposure was categorized into three categories. It was observed that 73.6% had a category 3 exposure, while 24.9% had category 2 exposure. Category 1 exposure was recorded in 1.6% of the participants. Site of exposure was classified as head & neck, trunk, superior extremities and inferior extremities. Majority of patients reported exposure site to be inferior extremities, 65.3%. Exposure in the superior extremity was reported in 25.3% of the patients attending the clinic. While 8.3% had exposure in their trunk, 1.1% got bitten in the head & neck region.

Table 3 presents the status of wound washing with respect to different categories of exposure. Overall 10.9% of the patients did not wash their wounds immediately or prior to attending the clinic. Remaining 64.8% however washed their wounds immediately. While 64.8% patients having category 3 exposure washed their wound a priori, 8.9% having same exposure did not. The percentage of patients having sustained category 2 exposure not washing wound immediately or before attending the clinic was 1.0% compared to washing wound in 23.8%. From the available information the delay in starting anti-rabies post-exposure prophylaxis schedule was calculated. It was observed that majority (64.8%) of the participants attended the clinic on the same day and started post-exposure prophylaxis. Another major portion (22.3%) started prophylaxis on the next day of exposure. Around 2.6% of the patients started the vaccination schedule at least after a week of exposure. (Fig. 2)

Results of compliance to anti-rabies post-exposure prophylaxis schedule has been presented in Table 4. It was observed that 60.5% of the patients completed the intra-dermal post-exposure prophylaxis schedule, but 29.5% did not. Out of those who did not complete the schedule, 3.6% only took the first dose. While 21.4% took the first two doses, majority i.e. 75.0% did not take the final dose of vaccine. Equine rabies immunoglobulin (ERIG) was given to all the category 3 exposure patients.

IV. Conclusion

The results of the current study were comparable to those of the other studies[9–12]. The biting animal in majority of the cases was dog with major bite site being inferior extremities. There was not any report of bite at multiple sites. The mean age of the victims were higher. This does not necessarily imply a lower incidence of animal bite in younger age, rather under-reporting and ignorance can be thought of, which ultimately will present a great challenge in the road to "zero by 30". Majority of those presenting had a category 3 exposure (as per WHO classification[1]). Though in a study from rural Bengal[10] the proportion of patients washing wound with soap and water was around 30%, the current study described a higher percentage of such practice. This is most likely contributed by the rural-urban difference in awareness level. But, the study found out that only around 68% of the victims attended the ARV clinic immediately or within 24 hours. Though comparative to other studies[9–12] a higher portion, around 70% completed their ARV schedule, 30% did not. Majority of them did not take the final dose (day 28). Some victims though only 2 in number, still did not continue after the first dose.

The current study hinted at larger future studies on the theme of post-exposure management of rabies with a longer available duration. Inferential remarks were not drawn about the practices and compliance in post-exposure treatment since gender, age, religion are likely not to be very efficient predictive factors. Despite its limitations the study strongly revealed the increased need for awareness generation regarding basic wound-care practices and importance of timely and complete post-exposure prophylaxis. In Indian perspective such self-care awareness initiatives are very much essential especially in the backdrop of "zero by 30" initiative.

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Tables & Figures:

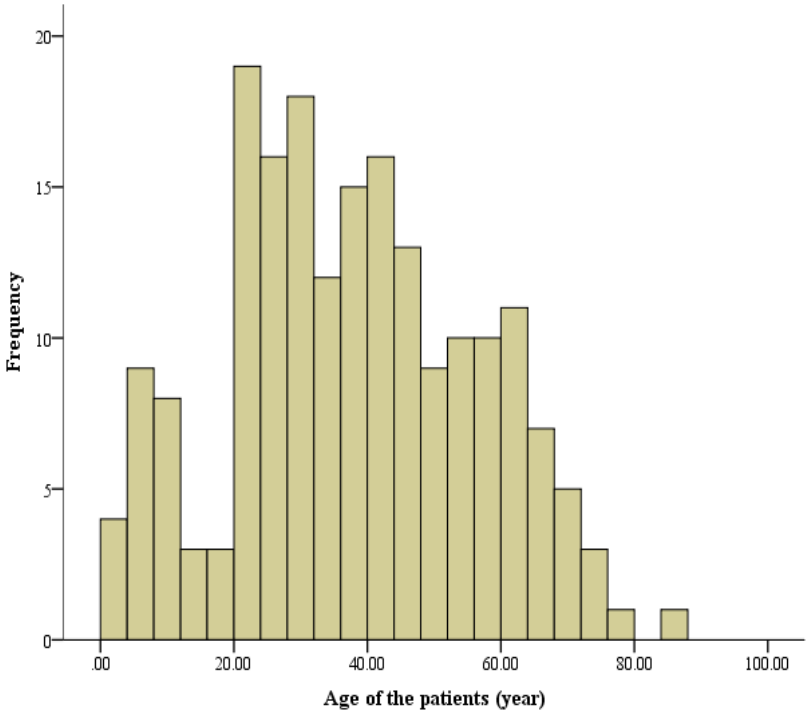

Figure 1. Histogram showing age distribution of the patients attending Anti-Rabies Vaccination clinic. (n=193)

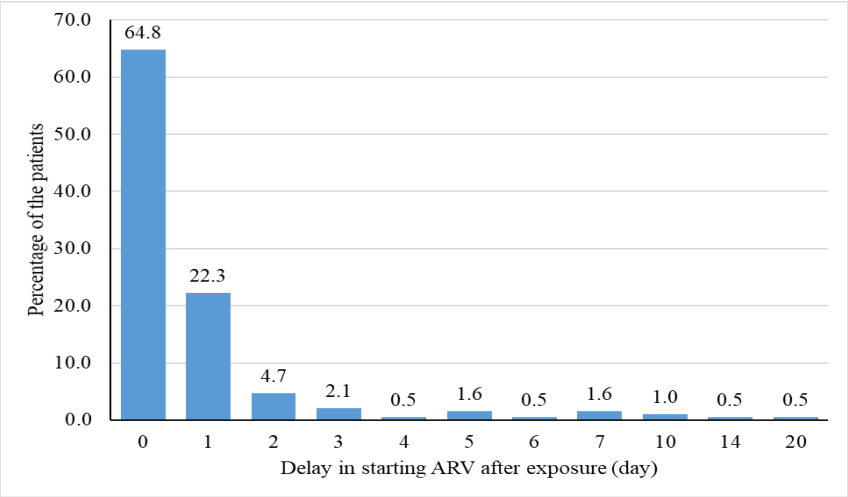

Figure 2. Distribution of the patients according to delay in starting Anti-Rabies Vaccine after animal bite. (n=193)

Table 1. Distribution Of The Patients According To Gender And Religion. (N=193)

		Frequency	Percentage
Gender	Female	45	23.3
	Male	148	76.7
Religion	Hinduism	151	78.2
	Islam	42	21.8

Table 2. Distribution Of The Patients According To Classification Of Animal Bite. (N=193)

		Frequency	Percentage
Biting Animal	Dog	137	71.0
	Cat	47	24.4
	Rat	5	2.6
	Monkey	3	1.6
	Horse	1	0.4
Category of Exposure	1	3	1.6
	2	48	24.8
	3	142	73.6
Site of Exposure	Head & Neck	2	1.1
	Trunk	16	8.3
	Superior extremeties	49	25.3
	Inferior extremeties	126	65.3

Table 3. Distribution Of The Patients With Different Categories Of Exposure According To Status Of Immediate Washing Of Wound. (N=193)

		Category of Exposure		
		Category 1 Frequency (%)	Category 2 Frequency (%)	Category 3 Frequency (%)
Washing of Wound Immediately (Before attending clinic)	Not done	2 (1.0)	2 (1.0)	17 (8.9)
	Done	1 (0.5)	46 (23.8)	125 (64.8)

Table 4. Distribution Of The Patients According To Compliance To Vaccination Schedule.

		Frequency	Percentage
Schedule complete (n=190)	Completed	134	70.5
	Incomplete	56	29.5
Incomplete dose (n=56)	Second dose onward incomplete	2	3.6
	Third dose onward incomplete	12	21.4
	Fourth dose incomplete	42	75.0