

Facilities and Services of Postexposure Prophylaxis in Anti-rabies Clinics: A National Assessment in India

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Abstract

Background: The rabies postexposure prophylaxis (PEP) is provided through anti-rabies clinics in the country. It was considered important to assess their facilities under a nationwide multi-centric survey. **Objectives:** The objective of this study is to assess the facilities available for PEP at the anti-rabies clinics and to ascertain the PEP provided at the anti-rabies clinics. **Methods:** The cross-sectional assessment was made from May 2017 to January 2018 in selected seven states of India. Thirty-five anti-rabies clinics from both Government and private; urban and rural areas from the states were assessed by an expert team using a pretested checklist for facilities and services available for PEP. **Results:** On an average, 10 new animal bite cases were attended at each anti-rabies clinic per day. The cold chain facilities for rabies biologicals were satisfactory. The facilities for wound washing (54.3%) and the use of antiseptics to animal bite wounds were not adequate. Rabies vaccines were administered by intramuscular in 54.3% and by intradermal route in 45.7% of the cases. The vaccine stock-outs were reported only in the government sector (18.5%). The type of rabies immunoglobulin (RIG) used was equine (63.2%) and human (36.8%); given free of cost in 40% of Anti rabies clinics. The local wound infiltration of RIG was in practice at 58.6% of anti-rabies clinics. The stock-out of RIG was more in private (50%) hospitals than in Government (40.7%) hospitals. **Conclusion:** The facilities available for PEP at the anti-rabies clinics were inadequate and have to be improved across the country.

Key words: Anti-rabies clinic, facilities, national assessment, postexposure prophylaxis

INTRODUCTION

Rabies is practically 100% fatal, but yet preventable. Globally, about 59,000 human rabies deaths are estimated to occur every year, of which about one-third, i.e., 20,000 is from India alone.^[1] The most common animals responsible for human rabies deaths are dogs (97%), cats (2%), mongoose, jackals, and other wild animals (1%).^[2] The disease occurs in over 100 countries throughout the world and poses a potential threat to >3.3 billion people worldwide.^[3] A combination of large human and dog populations in congested habitable areas combined with widespread poverty has led to more exposures in the World Health Organization (WHO's) south-east Asia region than in any other part of the world, with more than 1.4 billion people in the region are at risk.^[4,5]

The magnitude and epidemiological pattern differ from country to country. It is a disease of poverty, affecting vulnerable populations and children.^[6,7] Each year, an estimated 12 million people throughout Asia receive treatment after being exposed

to animals that are suspected of rabies.^[8] In India, an estimated 17.4 million animal bites occur annually and about 5 million rabies postexposure prophylaxis (PEP) are provided.^[9,10] In rabies endemic country like India, where every animal bite is potentially suspected as rabid exposure, the exposed individuals should seek early PEP; simultaneously, PEP should be started immediately at the health-care facility.^[11,12] Early and correct PEP will prevent rabies, even in high-risk exposures; the tools are available, but attitudes for utilizing the PEP facilities and provision of PEP at the health-care facilities should be positive.^[13]

The rabies PEP is provided through anti-rabies clinics, popularly known as ARCs in the country. ARCs are the health facilities manned by trained doctor/s and paramedics/nurse

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where individuals with rabies exposure are evaluated and managed.^[14] These ARCs are present in government sectors such as medical college hospitals, district hospitals, and other peripheral health institutions. These could be distinct separate entities with a board of “anti-rabies clinic” or merged with the OPD, injection rooms, casualty, etc. In the private sector, it is provided in an emergency room of a corporate hospital, nursing home, etc., or could be in the consulting room of a private medical practitioner. Ideally, these ARCs must be easily accessible and should have all the requirements for PEP and also standardized recording and reporting systems. Apart from these facilities, the ARCs should have sufficient workforce, cold chain equipment for storage of immune-biologicals and continuous power supply and generator backup.

As these anti-rabies clinics provide life-saving PEP against rabies, it was considered important to assess their facilities under the nationwide survey; conducted by the Association for Prevention and Control of Rabies in India (APCRI) under the aegis of the WHO, to know the present scenario of ARCs in the country with the objectives to assess the facilities available for PEP at the anti-rabies clinics and to ascertain the characteristics of PEP provided at the anti-rabies clinics.

MATERIALS AND METHODS

The study was initiated after getting the clearance from the Institutional Ethical Committee, Kempegowda Institute of Medical Sciences (KIMS), Bengaluru, Ref. no. KIMS/IEC/S15-2016 dated: December 5, 2016, and was conducted in 9 months duration from May 2017 to January 2018. The coordinating institution was the Department of Community Medicine, KIMS, Bengaluru; where APCRI headquarters is situated.

A geospatial representative sample from six different regions of the country, namely North, East, West, South, Central, and North-East, including seven states, namely Himachal Pradesh, Bihar, West Bengal, Manipur, Kerala, Madhya Pradesh, and Gujarat were chosen across the country. In each state, simple random sampling technique was used to select one district within the state and one taluka/block/tehsil within the selected district. Random numbers were generated using the “Randbetween” function of Microsoft Excel software in choosing the districts, taluka/block/tehsil.^[15]

The primary study unit, i.e., ARCs was selected from both Government and private set-ups; one in both urban and rural areas of each selected Talukas/blocks depending on availability and also the ARCs in the state headquarters of surveyed states. Thus, finally, a total of 35 ARCs in seven states were included and studied.

The survey team comprised senior medical professionals with experience of running ARCs and trained with the tools and techniques used in the study. Selected ARCs were visited by a team of investigators and were assessed for the availability of facilities and provision of PEP using a pretested and structured checklist. The various major items of assessment were the location and accessibility of the ARC, available

staff for providing PEP, average caseload/day, cold chain equipment, wound washing facilities, availability of anti-rabies vaccines (ARVs) and rabies immunoglobulins (RIGs), route/s and site of administration, charges for PEP, stock-outs of rabies biologicals within the previous period of 1 year, records maintenance, etc. The available records were also reviewed to gather the required data. All the data from the anti-rabies clinics were recorded in an excel sheet and analyzed using descriptive statistics such as frequency and percentages.

RESULTS

A total of 35 ARCs were assessed across the country, including both urban and rural areas to study the facilities available for PEP against rabies. Among them, 27 (77.1%) belonged to Government facility and 08 (22.9%) were from the private set-up. Similarly, 26 (74.3%) ARCs were from urban areas and 09 (25.7%) were from rural areas [Table 1].

All the ARCs were easily accessible to the exposed individuals. The medical officers and paramedics were available at all the ARCs; similarly, continuous power supply was also present. The cold chain facilities available were domestic refrigerator, ice-lined refrigerator (ILR), and deep freezer; 34 (97.1%) stored ARV in the domestic refrigerator and 1 (2.9%) in ILR. All the studied ARCs had general outpatient registers; whereas, the register for animal exposures was present in only 62.1% of ARCs and the case record forms for details regarding animal exposures and PEP provided were present in only 17.1% of them. The stock registers of ARV and RIG were maintained at only 69.9% of the ARCs [Table 1].

On an average, about 10 new cases of animal/dog bites were seen in these ARCs/day. The wound washing facilities were present in only 54.3%. All the anti-rabies clinics had ARVs and the vaccines used were Abhayrab, Rabipur, Vaxirab N, and Zoonovac V. The route of administration was intramuscular rabies vaccination (IMRV) in 54.3% of the ARCs and by intradermal rabies vaccination (IDRV) in 45.7% of ARCs. All Government institutions (except one) provided ARV free of cost. The stock-out of rabies vaccines in the government ARCs was 18.5%; whereas, some or the other brands of ARV was always available at all the private ARCs [Table 2].

RIG was available and used only in 19 (54.3%) of the ARCs [Table 2]. The use of equine RIG (ERIG) was in 63.2%, and human RIG was 36.8% of the ARCs. They were given free of cost in all the Government ARCs. The RIGs were given by exclusive local wound infiltration in 17 (58.6%) ARCs; both by local and remaining by systemic route in 12 (31.4%) ARCs. The stock-out of RIGs was more in private (50%) than in the Government health facility (40.7%) [Table 2].

DISCUSSION

Animal bites/exposures to humans is a public health problem; posing a potential threat of rabies to over half of the population worldwide. These exposures occur mainly in the underserved populations, both in rural and urban areas

Table 1: Profile and infrastructural facilities of the anti-rabies clinics (n=35)

Details/state	HP (n=9)	Bihar (n=4)	WB (n=6)	Manipur (n=3)	Kerala (n=2)	MP (n=6)	Gujarat (n=5)	Total (n=35)
Area								
Urban	6	4	5	3	1	4	3	26
Rural	3	-	1	0	1	2	2	9
Type								
Government	6	3	4	2	2	6	4	27
Private	3	1	2	1	0	0	1	8
Location of ARC								
Independent building	1	2	1	-	-	1	0	5
Easily accessible	9	4	6	3	2	6	5	35
Available resources								
Medical officer	9	4	6	3	2	6	5	35
Paramedics	9	4	6	3	2	6	5	35
Continuous power supply	9	4	6	3	2	6	5	35
Air conditioner	2	-	2	-	-	1	1	6
Cold chain facilities								
Domestic refrigerator	9	4	5	3	2	6	5	34
ILR	5	2	3	-	-	4	3	17
Deep freezer	3	1	3	-	-	4	2	13
Temperature logger	5	3	4	1	2	4	3	22
Records								
OP register	9	4	6	3	2	6	5	35
ART register	5	2	4	1	2	3	4	21
ART form	-	-	4	-	2	-	-	6
Stock register	6	3	4	3	2	2	4	24

HP: Himachal Pradesh, WB: West Bengal, MP: Madhya Pradesh, ILR: Ice-lined refrigerator, ART: Anti rabies treatment, ARC: Anti rabies clinic, OP: Outpatient

and have been documented for more than 4000 years.^[16] The goal of the ARCs is to provide life-saving PEP for all animal exposures and to make sure that people are not deprived of any component/s of PEP.^[17] It consists of thorough wound washing with soap/detergent and water, followed by application of virucidal agents to reduce the viral inoculum at the wound site; a complete course of postexposure vaccination to induce antibodies which prevents the risk of virus entering peripheral nerves after an exposure from a rabid animal and timely infiltration of RIG/rabies monoclonal antibodies (RMAb) in all Category III exposures to neutralize the virus at the wound site. Early and complete PEP will prevent the disease, even after high-risk exposure to potentially rabid animals.^[18]

The present study showed that the wound washing facilities at the ARCs were present in only 54.3%. Similarly, a multi-centric study conducted in 2007 at six selected centers across the country viz. Delhi, Hyderabad, Raipur, Jamnagar, Coonoor, and Rajahmundry; by the National Institute of Communicable Diseases, New Delhi also showed that the wound washing facility was present at only 17% of the studied centers.^[19] These studies showed that wound washing facilities, which is an important component of animal bite management, is still nonubiquitous.

The availability of rabies immune-biologicals varied in different study centers. All study centers had ARVs and 54.3% of them were given by intramuscular route. The stock-outs for ARVs were seen in 18.4% of the studied centers, because of the inadequate

supply. Similarly, a comparative study conducted in ARCs of Bengaluru in 2017 including one secondary and one tertiary care hospital also showed that the ARV were administered in 89% and 100% of the subjects, respectively; which showed that, though both the hospitals were situated in the same urban setting, the facilities provided vary with respect to provision of PEP.^[20]

In the present study, RIGs were used in only 54.3% of the study centers, because of the availability issue. Another comparative study conducted in anti-rabies clinics of Bengaluru in 2017 including one secondary and one tertiary care hospital showed that only 21.5% of Category III bites were administered RIG in secondary care hospital; whereas 96% of Category III bites were administered RIG in the tertiary care.^[20] Similarly, the national multi-centric study done in India across six selected government ARC showed that RIG was available at only 33% of ARCs.^[19]

A study on the evaluation of six animal bite treatment centers (ABTCs) in the Philippines during 2017 showed that the ARV was provided exclusively using IDRV by Updated TRC regimen (2-2-2-0-2). The policy for supply of ARV was “no report, no vaccines provided,” therefore, all ABTCs must submit timely reports. In spite of that, only, 73% and 30% of the ARV and ERIG demand was fulfilled, respectively, by the government.^[21]

Another study from Shimla in 2016, showed that the animal bite registers were incomplete and the availability of both the vaccines and immunoglobulins were irregular, thereby leading

Table 2: Attributes related to postexposure prophylaxis facilities at the anti - rabies clinics

Details/state	HP (n=09)	Bihar (n=04)	WB (n=06)	Manipur (n=03)	Kerala (n=02)	MP (n=06)	Gujarat (n=05)	Total (n=35)
Animal bite cases								
New cases/centre/month	136	510	402	250	420	351	210	298
Availability of first aid								
Wound wash	4	3	4	1	2	3	2	19
Antiseptic use	9	04	5	2	2	5	5	32
Vaccines available (multiple vaccines used)								
Available	9	4	6	3	2	6	5	35
Rabipur	1	0	4	2	0	1	3	11
Abhayrab	5	4	2	0	2	5	2	20
Vaxirab-N	3	1	1	1	-	-	-	06
ZoonovacV	-	-	1	-	-	-	-	1
Other PVRV	1	-	0	1	-	-	-	2
Route of administration								
IM	3	4	2	3	-	4	3	19
ID	6	-	4	0	2	2	2	16
Service charges								
Free	5	3	4	2	2	6	4	26
Charged	4	1	2	1	-	-	1	9
Vaccine stock outs								
Government	-	-	-	1	-	3	1	5
Private	-	-	-	-	-	-	-	0
RIGs availability								
Available	6	4	3	-	2	1	3	19
ERIG	6	2	2	-	2	-	-	12
Equirab	-	1	-	-	-	-	-	1
Premirab	4	1	-	-	-	-	-	5
CRI-K	2	-	-	-	-	-	-	2
Vinrig	-	-	2	-	2	-	-	4
HRIG	-	2	1	-	-	1	3	7
Berirab-P	-	2	1	-	-	1	0	4
Plasmabarab	-	-	-	-	-	-	3	3
RIG: Route of administration								
Exclusive local infiltration	6	2	3	-	2	1	3	17
Local and systemic	1	2	3	-	2	1	3	12
Service charges								
Free	6	-	2	-	2	1	3	14
Charged	-	2	1	-	-	-	-	3
RIG stock out								
Government	-	3	1	2	-	4	1	11
Private	-	-	2	1	-	-	1	4

HP: Himachal Pradesh, WB: West Bengal, MP: Madhya Pradesh, IM: Intramuscular, ID: Intradermal, RIGs: Rabies immunoglobulins, HRIG: Human rabies immunoglobulin, PVRV: Purified verocell rabies vaccine, CRI-K: Central Research Institute, Kasauli

to out of the pocket expenditure.^[22] Other study from Cuttack, Odisha in 2015 also showed that only 6 Government institutions out of 81 were providing PEP. Among them, the vaccines were available at all centers, whereas RIG was available in only one hospital.^[23] Similarly, a study from Government Medical College, Mandya showed that the ARV was out of stock for 81 days and RIG was also not available for a brief period.^[24]

These studies showed that rabies vaccine was available to some extent, but interrupted in the public sector, particularly in rural areas. Therefore, as rabies biologicals are lifesaving, it is important to ensure their uninterrupted supply in government

hospitals as the vast majority of animal bite victims are poor and visit these institutions. Similarly, CME programs have to be conducted across the country to improve the KAP of the treating physicians and to motivate them to use RIG/RMAb in all Category III exposures by infiltrating into the wound as much as possible and only remaining, if any, has to be infiltrated systemically, since it has got limited use for neutralizing the virus.

In countries where PEP is unavailable in the public sector, it is often still available in the private sector, but at a higher cost. In contrast to the relative availability of ARV, RIG was very scarce in the majority of countries and often prioritized to those with

very severe or high-risk exposures.^[25] Cold chain, distribution channels and frequency, monitoring, and reporting methods varied both between countries and within countries. Many countries use the same cold chain as for Expanded programme of Immunization vaccines. There is limited information on vaccine demand and utilization due to the lack of standardized monitoring tools.

CONCLUSION

The existing ARCs has to be strengthened by providing wound washing facilities and ensure uninterrupted supply of both ARV and RIGs under the national rabies control program, to provide complete PEP to all exposed throughout the year, to achieve Universal Health Coverage, thereby eliminate dog-mediated human rabies by 2030.^[26]

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Conflicts of interest

There are no conflicts of interest.

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