Title: Standardised Infrastructural parametrics in Rabies care: A need assessment

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SPECIAL ARTICLE

Standardised Infrastructural parametrics in Rabies care: A need assessment

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Introduction:

Rabies, a zoonotic disease caused by RNA-bearing Lyssavirus, causes severe fatal encephalitis in human beings following injuries inflicted by rabid animals. However, this disease is preventable, with pre-exposure prophylaxis (PrEP), or timely, appropriate post exposure prophylaxis (PEP).

Background:

Table 1: Statistics of Rabies Deaths and animal Bite victims attending Anti-rabies clinics in West Bengal and ID & BG Hospital, Beleghata, Kolkata which is self-explanatory.

	Year	Rabies cases	Animal bite victims at ARC
West Bengal	2016	42	268727
	2017	38	400029
	2018	46	371710
ID & BG Hospital, Beleghata	2019	38	27412
	2020	21	13759
	2021	15	16147
	2022 (till June)	11	---

The terminal days of a rabies patient is an unbearably stressful progression to tremendously violent predestined death. As a human being, the victim has full right to claim a least painful termination of life.[2] But in most of the situations these patients lie on an iron cot, guarded by iron rails, hands & legs tied to the bed stands, with a ceiling fan switched off (to avoid direct breeze to the patient) even in hot and humid atmosphere, in a secluded cabin at the furthest corner of the ward, waiting for the last

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breath, with minimum medical attention.

In case of Animal bite victims (ABV) attending the health care settings, the available infrastructure as well as facility delivery vary from one place to another. Availability of appropriate signages to guide these subjects are lacking in most centres. [3] Wound washing arrangements (extendable tap head, soap, flowing clean water), categorization guidelines, Treatment cards, even regular supply of vaccine / immunoglobulin are seen to be inadequate in some centres for some days in a year.[4] Wherever the services are better and regularly available, ABVs are seen to stand in a queue for hours together for their turn to get the inoculation.

Considering the prevailing status of care of both Rabies patients and ABVs, the present concept paper is being composed with the following broad objectives.

Objectives:

1. To relieve the rabies patient from the sufferings arising out of both external and systemic irritable preconditions precipitating convulsions and injuries.
2. To try to save life of those patients with the state-of-the-art critical care services utilizing the modern protocol.
3. To make arrangement for the best possible means so that these patients may pass away in a peaceful manner.
4. To make available necessary diagnostic amenities (institutional / external) for Rabies.
5. To protect the workforce (Health Care Workers)from the threat or chance of getting infected with rabies virus.
6. To set up a standard, well informed, patient friendly Anti-Rabies Clinic with adequate manpower and supply of required logistics.

Discussion & Recommendations:

Irritative stimulational events to a rabies patient may lead to extreme resultant effects in the form of convulsive episodes due to Photophobia (by bright light beam directed to the eyes), Aerophobia (by breeze of air), Hydrophobia (by sight or sound or attempt to drink water), even Phonophobia (by sudden loud sound).[5] In an attempt to minimize these preventable external stimuli, the patient is to be kept at an ambient temperature of around 24°C which is considered comfortable to a person at rest. This ambience will also become advantageous by bringing down the basal metabolic rate (BMR) of the individual who is already nutritionally deprived for continued nasogastric tube feeding. Utilization of Air-conditioning (AC) system (of appropriate tonnage, noiseless or low-noise and preferably split-type machines capable of recirculating the inside air) or Room Heaters (of proper wattage) is recommended. Infectious aerosols bearing live virus may be discharged in the room air during respiratory suction or other procedures. To reduce chances of transmission, the airborne viral load may be aptly controlled by Virus Control Units or likewise which are inbuilt in some available models of AC machines, the primary choice for installation.[6]

Duct type AC machines are discouraged unless negative pressure arrangements with High Efficiency particulate Absorbent (HEPA) filter guarded air entry and exit are installed. These AC machines are to be fitted in duplicate to facilitate alternate working to cool the cubicle round the clock.[7,8]

Ceiling or other types of fans are not to be utilised in presence of rabies patients to avoid direct breeze of air.

The enclosures need to be illuminated by electronically controllable and dimmed light sources[2], adequately covered and of very low intensity, avoiding straight beam to patient's eye. Foot lights (installed below the level of the bedstead) of soothing colour may be perused. However, for ease of examination and interventions, spot lights need to be made available, which are to be handled prudently.

It is advantageous to the victims if the room can be made isolated from external noises. So, sound-proofing might be planned for their terminal comfort. No (hand) washing or pouring of water is encouraged in the patient's cubicle.[9]

Comfortable, adjustable, railed cots(soft-covered and non-injurious) with inbuilt IV fluid stand (CCU Beds) are needed. Air mattresses are to be placed on the cushions.

At least two composite Medical Gas Pipeline System (MGPS) ports, capable of providing Medical Oxygen, Compressed air and Vacuum are essential. One is for administering oxygen therapy, the other may be perused for attaching Ventilator machine, if warranted.

Respiratory ventilation system (Ventilators) alongwith multichannel monitors (preferably with distant Central Monitoring System), Crash trollies, Endotracheal tubes, Punch Skin biopsy set, Laryngoscopes, Airways, Lumbar puncture sets etc. of

different sizes (including paediatric ones) are required to be made available for emergent situations. In addition, necessary drugs are to be kept handy.[10, 11]

Manpower requirement: As an example, human resources (HR) for a Six bedded Rabies corner is delineated.[12]

a) Medical Officer / SR (with CCU training) – Six (with at least two trained for PICU)

b) Nurses (with CCU training) – Eleven. (including one In-Charge)

a) MT (CCU) – Five.

b) GDA – Eight.

c) Sweeper – Six.

d) Dome – Two.

Regarding diagnostic facilities, "Point of care instruments" need to be placed in / near the ward / cubicles to perform emergency parameters, like Blood Gas Analysis, Serum Electrolytes, Haematocrit, Blood Count, Capillary Blood Glucose (CBG) etc. Laboratory back-up for other Pathological, Microbiological and Biochemical tests may be done in the respective sections / departments of the concerned hospital or through an external accredited agency / laboratory.[2] Recent references suggest possible advantages of perusal of Magnetic Resonanceimaging (MRI) as a non-invasive tool showing pathognomonic changes in the structure of the limbic system.[13] For exclusion of other diseases and to ascertain degree of co-morbidities, Digital X Ray, ultrasonography and CT scan services need to be made available.

Specific diagnosis of presence of Rabies virus or Antibodies in patients or ABVs needs the utilization of a 'Rabies Diagnostic Laboratory' with appropriate facilities.[14,15] It would be advantageous if these amenities are arranged institutionally, but cost-effective and feasibility analysis suggest that services from the Regional or National Level Laboratories may be a better option.

The Power back-up, Housekeeping and other maintenance issues are to be covered following current National Accreditation Board for Hospitals (NABH) norms.[16]

All levels of staff engaged in care, investigation, transport etc. of a patient suspected of or suffering from Rabies infection (not to forget about the corpse), should get a full course pf Pre-exposure Prophylaxis against rabies with timely boostering as per National Rabies Control Programme (NRCP) or WHO guidelines, before being engaged in such duties.[17]

For the ABVs, it would be highly beneficial if the following provisional recommendations are followed. Availability of adequate quantity of manpower and facilities all through the working hours is expected. For example, a unit catering to 100-200 patients per day may be constituted with the following resources:

A. Human Resource (Trained):

1. Nodal Officer – One.
2. Physician – GDMO – Four.
3. Nurses – GNM+ In-charge – (Eight + Two).
4. Pharmacists – Two.
5. Data Entry Operators (DEOs) – Four.
6. GDAs – Eight.
7. Sweepers – Six.

B. Physical Infrastructure:

1. Sign boards.
2. Directional boards.
3. Organizational Charts.
4. Time schedule.
5. Flow Charts / Algorithm of 'Decision to treat'.
6. Wound washing facilities – taps with extendable / adjustable nozzles.

7. IEC hoardings, LED/LCD screens continuously showing of Audio-visual presentations (placed at strategic location).
8. Computers with peripherals, including printers (in required numbers).

C. Logistics:

1. National Guidelines of Rabies Prophylaxis (Updated) – Copies to be made available at all utility points.
2. Dressing kits.
3. Weighting scales (for calculation of doses of Immunoglobulins).
4. Soaps & Gloves.
5. Needle – mounted Insulin Syringes and / or Auto-disabled Disposable syringes (0.5ml, 1ml, 2ml).
6. ARV &Immunoglobulins (ERIG / HRIG / RmAb).
7. Emergency Drug Trays &IV Fluids.
8. BMW Waste bins & Sharp boxes.
9. Phlebotomy sets and Blood collection vials.
10. Vaccine carriers & Cold boxes.
11. Autoclaves.
12. Refrigerators with Calibrated thermometers.
13. Standardized Recording & Reporting system including Registers & Vaccination cards (in duplicate).
14. Message based vaccine Reminder service through Cellular Network, if made available, will help to reduce vaccine drop-out.

Referral / Consultation:

Surgical / Plastic surgery consultations may be required which may be provided institutionally or on referral to a nearby appropriate centre / hospital / Medical College. Anti-Rabies antibody estimation, if necessary, from serum, may be performed in a similar way or at a regional or national rabies diagnostic laboratory. [18, 19]

Fund:

The required fund is to be ascertained for the Non-recurring expenditures and Recurring Expenses (including training and awareness activities) in the form of yearly budget and submitted for approval. For Private / Non-profit organisations, financial viability may be ensured by levying User-charges from the clients at a nominal / acceptable rate.

Conclusion:

This concept paper aims at development of the long awaited guideline towards the required standard infrastructure, amenities, manpower, logistic and other essentialities for the rabies suffers as well as Animal Bite Victims. It would also help to protect the health care workers against rabies. Even in a resource constrained settings, establishing an ideal set-up will go a long way to prevent human rabies as well as a comprehensive humaneterminal care of the rabies patients. If these suggestions are studied, modified (if necessary) and accepted by the experts and authority concerned, it is highly expected that, these are set to change the public acceptance and utilization scenario in rabies care and prevention services, not only in the state of West Bengal or the country of India, but also throughout the world, where this virus-borne disease still exists as a life-threatening menace.

Ethical Clearance:

This endevour is made on pen and papers for the beneficial suggestions to mankind. As no human / animal experimentation was done / contemplated, no ethical impingement is anticipated.

Conflicts of Interest: Nil.

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