RABIES IN INDIA: A RELOOK AT THE NEGLECTED RAMPANT DISEASE

HINDISTAN'DA KUDUZ HASTALIGI: IHMAL EDILEN YAYGIN HASTALIGA YENIDEN BIR BAKIS

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Abstract

Rabies is a tropical zoonotic disease, transmitted to human being by carnivorous animals. Majority of human rabies cases were reported from Asia and African countries. India recorded more deaths from rabies than any other country in the world. There is no effective treatment for rabies; it can only be prevented by vaccination. It needs multiple levels of interventions at human and animal level.

World Health Organization’s target is to eliminate the disease by 2020 in endemic South-East Asian countries which include India. Key challenges in control of rabies in India are lack of intersectoral coordination, weak surveillance system on rabies, inadequate rabies research and lack of sustainability. To conclude, breaking the rabies cycle in a sustained manner is necessary to eliminate rabies from this part of the world.

Keywords: carnivorous animals, prophylaxis, elimination

1. Introduction

Rabies is primarily a disease of warm blooded carnivorous animals like dogs, cats, jackals, monkey, bats and wolves and transmitted to human being by the bites or licks of rabid animals. It is caused by RNA virus belongs to Lyssa virus genus manifests as viral encephalitis in human beings and once symptoms develop, it is always fatal to human beings. There is no effective treatment for rabies; it can only be prevented by vaccination. According to World Health Organization (WHO), the annual cost of rabies worldwide estimated to be about 583.5 million US$, most of which is attributed by post-exposure prophylaxis (WHO, 2005). Even though a completely preventable disease, it is still a public health problem in India and other developing nations.

2. Clinical manifestation of human rabies

Median incubation period was 54 days for all naturally acquired human rabies (dog acquired - 64.5 days, bat acquired - 51 days). Two different forms of rabies are documented namely furious and paralytic rabies. Clinical features specific to human rabies are headache, sore throat, malaise, fever, meningismus, insomnia, slurred speech, encephalopathy, biting, hyperarousal, hydrophobia, larynx/faces spasms, aerophobia, myoedema and priapism. Other manifestations are tremor, convulsive or non convulsive seizures, status epilepticus, sweating, piloerection, hypersalivation, increased lacrimation, ataxia, myoclonus, chorea and dilated pupils. On the bite site, there will be pain, paresthesia, pruritus

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and numbness. Cranial nerves manifestations are dysphagia, bilateral or unilateral facial weakness, ptosis, ophthalmoplegia and anisocoria. Late complications include coma, syndrome of inappropriate antidiuretic hormone secretion (SIADH), Diabetes insipidus and several complications on cardiovascular, respiratory and gastrointestinal systems. Hydrophobia, aerophobia and encephalopathy are more common in dog acquired rabies. In bat acquired rabies, abnormal cranial nerve, motor and sensory manifestations such as tremor, myoclonus, and local sensory abnormalities are more common. Death will occur within 7-10 days, after onset of symptoms and usually by respiratory paralysis (Udow SJ et al., 2013).

3. Neurobehavioral symptoms of rabies
Mental changes are anger, fear of death, irritability and depression. Hallucinations, anxiety, confusion, restlessness and high level of excitement are other common symptoms. Even few cases had been presented as acute psychiatric emergencies with symptoms like that of delirium tremens and schizophrenia (De Wet JSDT, 1980). Conversely, pseudorabies is a condition reported in a hypochondriac patient in which the patient with history of dog bite behaved as though he was having rabies (Bidaki R et al, 2013).

4. Burden of the disease
It is a neglected tropical zoonotic disease, with 50,000-55,000 deaths each year worldwide. Around 95% of human rabies occurs in Asia and African countries. It is estimated that there are about three billion people living in the region at risk for rabies in over 100 countries. India recorded more deaths from rabies than any other country in the world with 25,000-30,000 deaths annually (Wunner WH & Briggs DJ, 2010). Human rabies was reported throughout the country except Andaman, Nicobar and Lakshadweep islands. Since rabies deaths occur in a scattered manner, it doesn’t pose epidemic threat to claim immediate action (Chatterjee P, 2009).

5. Strategies for prevention of rabies
Due to the complex nature of rabies control, it needs multiple levels of interventions with respect to humans and animals. Prevention of infection at human level by pre-exposure prophylaxis for high risk group and post-exposure prophylaxis for exposed persons. Animal interventions includes registration and licensing of dogs, immunization of dogs, restraint of dogs in public places, control of stray dog population by birth control, destruction of dogs bitten by rabid animals, quarantine of imported dogs for 6 months and better solid waste management (WHO, 2007).

6. WHO’s strategy for endemic South-East Asian countries
World Health Organization’s regional office for South East Asia, after an expert consultation provided a regional strategic framework in 2011 for eliminating human rabies transmitted by dogs. The target is to eliminate the disease by 2020 in endemic South-East Asian countries. The initial strategy is to reduce by half the current number of human rabies death by 2016 which covered a period of 5 years from 2012-2016 (WHO, 2012).

7. India’s action towards rabies
Government of India as per WHO’s recommendation, had replaced nerve tissue vaccine with cell culture vaccine since 2004. Planning commission had identified rabies as priority zoonotic disease in its 11th five year plan. Government of India has introduced pilot project on rabies control programme from 2008 to 2011 with the objectives of prevention of human deaths due to rabies and reduction of transmission of disease in animals. It has set a target to reduce the human rabies deaths by at least 50 per cent by the end of the 11th Plan period which covered Delhi, Ahmedabad, Madurai, Pune, and Bangalore (Planning Commission of India, 2011).

In 12th five year plan, Government of India has planned to extend this comprehensive programme which has both human and animal component. This programme focuses on training health professionals about management of animal bites, providing post exposure prophylaxis, creation of awareness and reduction of animal bites, vaccination and sterilization of dogs (Dhar A, 2012).

Government of India, National Center for Disease Control, New Delhi, WHO collaborating center for Rabies Epidemiology has released Revised National guidelines on Rabies Prophylaxis in 2013 for bringing out uniformity in post exposure prophylaxis. It gave guidelines for indications of anti-rabies vaccine and rabies immunoglobulin. It recommends the use of cell culture vaccine given either intramuscularly or intradermally for pre/post exposure prophylaxis. It also stresses on using rabies immunoglobulin for category II immune compromised patients and for all category III animal bites (Government of India, 2013). Government of Tamil Nadu, Rabies control initiative is a first large scale comprehensive programme on rabies started in the year 2008, with universal coverage targeting both human and animal population (Abbas SS et al., 2014).

In collaboration with local non-governmental organization, the health departments of Chennai, Jaipur and Kalimpong have achieved zero rabies incidence followed by sustained Animal Birth Control-Anti Rabies Program (ABC-AR Program) (Krishna, S.C, 2010). Sikkim is about to be certified free of rabies followed by statewide campaigning for vaccination of dogs (Chatterjee S & Riaz H, 2013).

8. Epidemiological situation of animal bite
Every year, about 1.7% of Indian population gets bitten by animals of which only 46.9% took anti rabies vaccine (Rahman AS, 2011). Around 97% of human rabies are transmitted by dogs of which 62.9% were stray dogs, followed by cats 2% and others 1% (Jackals, Mongoose) (Government of India, 2013). The vulnerable groups for rabies are males, children below 15 years, poor and
uneducated people, and those who are living in rural area (Chatterjee P, 2009; Rahman AS, 2011; Suraweera W et al., 2012). Among those vaccinated, compliance to full course of vaccine was found to be 40.5% and was not satisfactory. It has been shown that adequate local wound treatment can reduce the chances of developing rabies by up to 80%. Among the animal bite victims, only 39.5% washed their wounds with water and soap (Sudarshan MK, 2004). The use of rabies immunoglobulin was very low at 2.1% (Kole AK et al., 2014). Vaccination of 70% of total dog population in an area for a period of six months is needed to achieve herd immunity. But only few cities are conducting sustained anti-rabies vaccination for stray dogs (Chatterjee P, 2009).

9. High mortality of rabies in India

It was attributed by huge stray dog population which accounts for 25 million throughout India that poses great risk to the people. Moreover, there was lack of awareness about rabies and lack of understanding of the need for immediate action against rabies together with poverty, unavailability of anti-rabies vaccine and immunoglobulin (Sudarshan MK, 2004). Ichhpujani et al study reported that only 30% knew how to clean the wound after any animal bite and majority of the study population were not compliant with the treatment guideline (Ichhpujani RL et al., 2006). Interventions against rabies were mainly concentrated in urban areas leaving behind the vulnerable rural area (Abbas SS et al., 2014).

10. Poor disease surveillance system on rabies

Better estimation of rabies incidence is not available because of lack of systematic rabies disease surveillance system and moreover it is not a notifiable disease in India (Maroof K, 2013). And many cases were not reported and some other cases were missed because of atypical presentation (Rahman AS, 2011). It has been found that there was a gap between rabies research done in India and existing rabies policy interventions. Even though, India contributes to more number of rabies cases globally, Indian research output represents only 4.4% of the global research on rabies (Abbas SS & Kakkar M, 2013). Multicentric studies should be undertaken to reveal the true status of the disease, thereby it will provide a proper input for policymakers to develop strategies against rabies.

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**Table 1: Time line of anti-rabies action in India**

<table>
<thead>
<tr>
<th>Year</th>
<th>Action</th>
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<tbody>
<tr>
<td>1907</td>
<td>Neural tissue anti-rabies vaccine was manufactured in Pasteur Institute of India, Coonoor (Lahariya C, 2014).</td>
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<td>1911</td>
<td>David Semple (an officer of the Indian Medical Service) developed Semple antirabic vaccine using carbolized dead virus in Central Research Institute in Kasauli (Chakrabarti P, 2010).</td>
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<tr>
<td>1970</td>
<td>Beta-propiolactone (BPL) inactivated rabies vaccine developed in Pasteur Institute of India, Coonoor (Lahariya C, 2014).</td>
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<td>1995-1996</td>
<td>Chennai and Jaipur were the first cities to start sustained ABC-AR program (Krishna, S.C, 2010).</td>
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<tr>
<td>2007</td>
<td>Replaced nerve tissue vaccine with cell culture vaccine for post exposure prophylaxis (Planning Commission of India, 2011).</td>
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<tr>
<td>2007</td>
<td>Government of India has introduced pilot project on rabies control programme in five cities (Planning Commission of India, 2011).</td>
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<tr>
<td>2008</td>
<td>In Tamil Nadu, Rabies control initiative started (Abbas SS et al., 2014).</td>
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<td>2012</td>
<td>Planned to expand the pilot project to whole nation in 12th five year plan (Dhar A, 2012).</td>
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11. Key challenges in rabies control

Current challenges are lack of intersectoral coordination between multiple disciplines involved in rabies control like public health department, animal husbandry department, government and non-government agencies; limited information on dog population, poor surveillance data on human and animal rabies, lack of adequate dog bite epidemiology for predicting vaccine requirement, delay in scaling up of successful pilot interventions from local setting to national level, poor diagnostic capacity, limited evidence of effectiveness and efficacy of interventions in different ecological settings, lack of thrust on environmental management which contribute to uncontrolled dog population (Kakkar M et al., 2012).

To conclude, breaking the rabies cycle in a sustained manner is necessary to eliminate rabies from this part of the world. For elimination of rabies by 2020, strong political commitment along with intersectoral coordination between government and non-governmental health agencies are essential for promoting the use of intervention tools at human and animal level throughout the nation.

References


