

RABIES AND VACCINATION FAILURE: Two Case Reports

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ABSTRACT

Objective: To highlight the health implications of increase in the stray dogs population and outline the problems of post exposure prophylaxis.

Setting: Medical Unit, Ayub Medical College, Abbottabad.

Findings: Both the cases developed rabies despite post exposure rabies vaccination. First case presented with psychiatric features.

Conclusion: Post exposure rabies vaccination is difficult to rely upon in our healthcare setup, unless its efficacy has been confirmed by measurement of protective antibody titre. This may be expensive but strategies need to be worked out to make it cost effective.

KEY WORDS: Rabies, Anti-rabies vaccination failure.

CASE REPORT

A 21 years old young man on admission to the medical unit complained of headache malaise and nausea for the last two days. There was no history of fever, cough, diarrhea and head injury or drug addiction. On further questioning he confided that he was harbouring

snakes in his throat. He attributed his illness to some thing he has taken in the train while coming from Karachi to Peshawar three days ago.

He was found to be anxious agitated and was slow to respond. Neurological examination of the cranial nerves, sensory motor system, deep tendon reflexes and planter response did not reveal any abnormality. There was no spinal tenderness or neck rigidity. Rest of the systemic examination was also not of any positive diagnostic avail. A tentative diagnosis of psychiatric illness, possibly schizophrenia was made while encephalitis could not be excluded at this stage.

His preliminary blood tests and serum biochemistry was reported as normal as were his chest radiograph and C.T. scan of the brain. C.S.F. report revealed three white blood cells/ml and protein content of 55 mg/dl. He was empirically started on third generation cephalosporins and was given benzodiazepines.

He developed lacrimation and hypersalivation during the next two days was found affirmative for hydrophobia and aerophobia. He

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was alleged to be bitten by the dog a year ago but was vaccinated from the local dispensary. No details about the vaccine dose and schedule of vaccination were available. He went into coma on 7th day of hospitalization and died of hypopnoea the next day. His attendants were consoled and advised post exposure prophylaxis for Rabies.

The second case of rabies was brought to the hospital with typical symptoms of rabies with aerophobia and hydrophobia and agitation. He drifted into coma over the next few days and was taken by the attendants to their home, anticipating the impending death. He was bitten by the dog three months ago and was given vaccine from the office of the District Health Officer. The type of the vaccine and the vaccination schedule followed was not known. The grief stricken relatives of the deceased approached the author later and asked about the ways and means to ensure the efficacy of anti rabies vaccination.

DISCUSSION

Rabies is a major health hazard in the areas where population of stray dogs is uncontrolled.¹ Human rabies occurs routinely in Africa and Asia. About 30000 cases of rabies are reported to the WHO annually while the actual figure may be many times more. Children are at particular risk of developing rabies because of their stature, curiosity and lack of fear and awareness. With the tremendous biting force of 450 pounds per square inch the dog can easily devitalize human tissue and inoculate the virus.⁸ The rabid animal dies within seven days of becoming infective thus limiting the period of infectivity. This may be the nature's way of keeping the balance.

After its initial multiplication in the striated muscles the rabies virus finds its way into the central nervous system, traveling at speed of 3mm per hour, centrally, concentrating its damaging effect in the Pons and floor of the 4th ventricle, leaving the cerebral cortex relatively unaffected¹⁴. The clinical picture is one of the most dramatic in medicine. The encephalitis

phase is ushered in after a prodromal period of 5 to 7 days and is characterized by burst of hyperactivity, disorientation and bizarre combative behaviour, alternating with lucid periods during which the patient is conscious and aware.

Hydrophobia and aerophobia are telltale bedside features of rabies. Twenty percent of patients show symmetrical ascending paralysis with flaccidity and diminished deep tendon reflexes. This may be mistaken for Guillain Barre Syndrome or Poliomyelitis. Rabies may present with signs and symptoms of schizophrenia, psychosis or mania. This may not only distract from the true diagnosis initially but also expose the patient's attendants to the rabies virus unknowingly.^{3,4}

Although the diagnosis of rabies is vastly clinical, laboratory confirmation can be attained, before the patient's death by the fluorescent antibody stain of smears of corneal epithelium cells or section of the skin from the neck at the hairline. Neutralizing antibodies develop to a very high titre, after the acute phase, but by then it is too late.^{5,6}

As the mortality from rabies is 100 percent the availability, efficacy and administration of the vaccine according to the protocol deserves guarded supervision and accountability. The currently developed cell culture vaccines are superior to the embryonated tissue vaccines. For the previously unvaccinated person 5 doses vaccine is given intramuscularly in the Deltoid (not intragluteally) on day 0,3,7,14 and 28. The dose is not reduced for children. Antimalarial drugs and corticosteroids are to be avoided during the anti rabies vaccination⁷. WHO has approved a regime for human diploid cell vaccine, for intradermal administration. This is given in two doses of .1ml on two sites on days 0,3 and 7 then .1 ml is given on single site on day 21 and 90. This may cut the cost but protracted vaccine schedule and lack of widespread availability of technical skill for intradermal administration makes this regime less practicable⁸.

The efficacy of rabies vaccination is high when administered under ideal conditions but

its failure rate is considerable in our set up because of many reasons. Repeated power failures and lack of refrigeration facilities in the rural areas leads to reduced efficacy of vaccine. Patients or their attendants tend to take these vaccines to their homes and store and administer them in an unsupervised manner. Passive immunization with antirabies globulin is neither advised nor offered by the primary healthcare staff. Vaccination failure is more if antirabies serum is not administered concomitantly especially in cases of severe dog bites.⁸

Under our health care setup, the confirmation of the protective antibody response is vital but this facility is not available even at some tertiary care hospitals. This is also expensive and there is a need to develop strategies to make it cost effective. The cost of antirabies vaccine and globulin runs in thousands and is clearly beyond the reach of masses. An accessible network of inexpensive and reliable vaccine source is the need of the day. Establishment of exclusive anti-rabies centers at the district or divisional level can provide meaningful assistance to the public. Availability of antirabies vaccine through the network of the Expanded Programme of Immunization can circumvent the financial considerations. The district physician must be involved in the advisory and supervisory role in coordination with the District Health Officer. The culture of providing free vaccine for rabies is not sustainable given our limited health resources. The vaccine and the serum may be made widely available in the market.

The Casualty Medical Officers are the ones who encounter these cases first. They should

be in a position to offer expeditious consultation and advice regarding the source and use of the anti-rabies vaccine and serum under supervision. The world has benefited from the technical advances of vaccine development but it has yet to witness a breakthrough in the development of anti-rabies drugs.⁹

REFERENCES

1. Manson Bahr, Rabies and slow virus. Manson's Tropical diseases, 9th edition Chapter 42;798-802, ELBS, 1987.
2. Fisher DJ. 'Resurgence of Rabies' A historical perspective on rabies in children. Arch Pediatric Adolescence Med 1995, Sept. 149(3):306-312.
3. Goswamo U, Shankar SK et al. 'Psychiatric Presentations in Rabies' Tropical Geographic Med. 1984, March 36(1): 77-81.
4. Lawrence Cowey 'Rabies virus and other rhabdoviruses. In Harrison's Principles of Internal Medicine, 14th Edition. Ch 199, 1128-1131. Anthony Fauci et al; McGraw Hill, Inc 1998.
5. Sacramento D et al. 'PCR technique as an alternative method for diagnosis and epidemiology of rabies virus Molecular cell probes 1991; 5:229.
6. Anderman AE, Bite wounds inflicted by dogs and cats' Vet clinics of North America., Small animal practice; 1987; 17: 195-207.
7. Rressen DW. Global review of rabies vaccine for human use, Vaccine, 1997; 15-S-2.
8. WHO Expert Committee on Rabies; Technical Report Series No. 824; Geneva; WHO. 1992.
9. Assaad FA, Schild GC. The WHO Programme for prevention and control of viral, chlamydial and rickettsial disease' Arch Virol, 1983; 76(4): 275-88.