

India's ongoing war against rabies

Roughly 36% of the world's rabies deaths occur in India each year, most of those when children come into contact with infected dogs. In collaboration with key partners, India's federal government is working with other countries to tackle the problem. Patralekha Chatterjee reports.

Dr Rajendra Singh, a senior doctor at Maharishi Valmiki Infectious Disease Hospital in Delhi, India, knows a thing or two about despair. And regret. He sees it every day in the faces of the parents who bring their children to him for treatment. The children are infected with the rabies virus, and most of them arrive too late. "Families come from far away," says Singh. "They don't know that past a certain point rabies is 100% fatal. Once they learn the truth, their first reaction is to go into a state of denial. A week ago, we had a family who started waving currency notes. They wanted us to save their son at any cost."

Rabies is caused by a virus that is transmitted to humans through the infected saliva of a range of animals. But most human deaths follow a bite by, or exposure to, an infected dog. Between 30% and 60% of the victims of dog bites are children under the age of 15 in countries where rabies is endemic. The Maharishi Valmiki is the only hospital in the city of Delhi that treats rabies patients, many of whom are poor and uneducated and most of whom are children and young people. Like Pinkish Kumar, a five-year-old from a Delhi slum, who was brought

to the hospital complaining that he was unable to swallow water. Fear of water or hydrophobia is one of the disease's tell-tale symptoms. Pinkish had been bitten by a dog. He died three days later.

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Terrible in itself, Pinkish Kumar's death, like the deaths of so many children in India, is all the more tragic because it could have been prevented. Had the little boy's parents sought treatment when he was first bitten, his chances of surviving would have been excellent. Wound cleansing – including washing of the wound with soap and water for five minutes – followed by

immunization after suspected contact with an infected animal can prevent symptoms from developing.

World Health Organization (WHO) recommendations for post-exposure treatment divide rabies exposure into three categories: category I – and least serious – when the victim has been touching or feeding infected animals, but shows no skin lesions; category II, when the victim has received minor scratches without bleeding or has been licked by an infected animal on broken skin; and category III, when the victim has received one or more bites, scratches or licks on broken skin or has had other contact with infected mucus.

Exposure to bats, whatever the nature of the contact, falls under category III, and the victim is treated accordingly. Anti-rabies vaccine is recommended for category II and III, while anti-rabies immunoglobulin – a liquid or freeze-dried preparation containing rabies antibodies extracted from plasma – should be given for category III contact, or to people with weakened immune systems. Not only is rabies treatable if caught early enough: the virus carried by the dog population is also controllable. "The basic principles of dog rabies control are relatively simple. It is necessary to vaccinate 70% of the total dog population in a short period of time, maintain that immune coverage and protect the area from spillover through control of dog movement from affected adjacent areas," says Dr François-Xavier Meslin, a team leader in WHO's department of neglected tropical diseases.

Things become a little more complicated when the dog population gets out of hand, as is certainly the case in many parts of rural India. Estimates vary, but some put the Indian dog population as high as 25 million. Rounding up and vaccinating that many dogs is not just a technical challenge, it is a test of community spirit and, ultimately, political will. Says Meslin: "The most important success factors are high-level political commitment, dedicated and knowledgeable national staff championing the project inside and outside the country and good community involvement."

Until fairly recently, this kind of commitment was lacking in India, where 20 000 of an estimated global annual 55 000 rabies deaths occur,



WHO/Patralekha Chatterjee

Stray dogs from north-western Delhi have been herded into a van. The dogs were then to be taken to hospital to be vaccinated against rabies and sterilized.

three-quarters of them in rural areas. One of the reasons the disease has been neglected is because “deaths are scattered” and never amount to the kind of crisis that get epidemics top billing.

Indeed, experts say that the main constraint to rabies elimination in India is the lack of coordination and the lack of a comprehensive national programme. They agree that since India shares borders with six countries that are all rabies endemic, it is essential that India’s rabies control efforts are coordinated regionally. Other Asian countries, such as Sri Lanka and Thailand, have made progress by taking a nationally coordinated approach, but there are signs of improvement in India.

On the treatment front, where cost and efficacy have been issues in the past, India has moved away from nerve-tissue based vaccinations of the kind first developed by French 19th-century scientist Louis Pasteur to adopt modern cell-based vaccines. Nerve-tissue based vaccination required painful injections into the abdomen with a large bore needle, while cell-based vaccines are comparable to flu shots in terms of pain and side-effects. The federal government has also adopted national guidelines in favour of intradermal vaccination, where a smaller quantity of vaccine is injected into the outer layer of the skin and costs 60–80% less than the US\$ 40–50 paid for intramuscular vaccination. This is an important consideration in contexts where the cost of treatment is met in part – if not fully – by the patient. Eight out of India’s 28 states and seven federally administered Union Territories have announced plans to introduce intradermal regimens this year. Finally, according to government statistics, India is currently producing just under 15 million doses of human rabies vaccine and just over half a million vials of equine rabies immunoglobulin annually – quantities that meet the national requirement.

Meanwhile the government is doing more to promote rabies awareness with initiatives such as a pilot project to prevent human rabies deaths launched by the National Centre for Disease Control (NCDC) – formerly the National Institute of Communicable Disease – in 2008 in five Indian



Delhi-based Sonadi Charitable Trust has joined the municipal campaign to help control the canine population by vaccinating and sterilizing dogs.

cities. The pilot includes training of health professionals in animal-bite management and raising public awareness about the need to seek post-exposure treatment, notably through posting messages on buses and in other public places. For instance, one poster shows a photograph of a dog biting a woman’s leg, and warns: “Don’t ignore animal bites or scratches.”

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Launched in collaboration with WHO, the pilot also aims to ensure that anti-rabies vaccines and anti-rabies serum are available and to boost the ability of hospitals and health centres

to diagnose cases. A significant part of the pilot is close cooperation with the national animal husbandry department and partners in other sectors.

“Over the past year, a core group of 1500 doctors and nurses has been trained,” says Dr Veena Mittal, joint director and head of the zoonosis division at the NCDC, adding that the NCDC is also working to ensure availability of vaccine and human rabies immunoglobulin in the pilot project areas. Mittal says that the NCDC is working closely with the municipal corporations of the five cities involved in the pilot project to strengthen their diagnostic capacities and to develop testing facilities for surveillance purposes. As a result, attendance at anti-rabies clinics and the use of immunoglobulin have both increased.

The contribution of nongovernmental organizations has also been a crucial part of an improving picture, notably from the Rabies in Asia Foundation, the Association for Prevention and Control of Rabies in India and the Animal Welfare Board of India, which is promoting the Animal Birth Control Anti-Rabies Programme in major metropolitan cities. Most recently the Schering–Plough Corporation – a global health-care company – announced it is sponsoring two projects in 10 villages surrounding Bangalore and Pune, focused on educational awareness and the mass vaccination of dogs. ■