

## Human rabies in India: a problem needing more attention

Alakes Kumar Kole,<sup>a</sup> Rammohan Roy<sup>a</sup> & Dalia Chanda Kole<sup>b</sup>

Rabies is fully preventable. About 563 million United States dollars are spent annually in the world on measures to prevent rabies,<sup>1</sup> yet in countries of south-eastern Asia the disease is still an important public health problem. An estimated 45% of all deaths from rabies occur in that part of the world.<sup>2</sup> The situation is especially pronounced in India, which reports about 18 000 to 20 000 cases of rabies a year and about 36% of the world's deaths from the disease.<sup>3</sup> Rabies incidence in India has been constant for a decade, without any obvious declining trend, and reported incidence is probably an underestimation of true incidence because in India rabies is still not a notifiable disease.<sup>4</sup> This situation is rooted in a general lack of awareness of preventive measures, which translates into insufficient dog vaccination, an uncontrolled canine population, poor knowledge of proper post-exposure prophylaxis on the part of many medical professionals, and an irregular supply of anti-rabies vaccine and immunoglobulin, particularly in primary-health-care facilities.

In India, rabies affects mainly people of lower socio-economic status and children between the ages of 5 and 15 years.<sup>4</sup> Indian children often play near stray dogs, which are many and roam freely, and are used to sharing their food with them, which results in frequent bites. In one study, most children attacked by dogs were unaware of having been bitten and their parents often ignored the attacks or simply treated the wounds by applying indigenous products such as hot peppers or turmeric. Only a few parents sought medical advice, usually with delay.<sup>1</sup>

According to one study, only 70% of the people in India have ever heard of rabies, only 30% know to wash the wounds after animal bites and, of those who get bitten, only 60% receive a modern cell-culture-derived vaccine.<sup>4,5</sup> Ironically, in this era of mass communications and advanced health systems, even physicians sometimes know little about proper prophylactic measures following animal bites. A recent report from a medical college in Kolkata showed that most medical

interns were not very familiar with proper post-exposure prophylaxis because during training they saw few cases of animal bite, which were managed in other specialized hospitals.<sup>6</sup> It is crucial to administer anti-rabies immunoglobulin immediately after a bite categorized as severe (grade III), but erroneous wound categorization by health-care providers, especially in cases presenting late for treatment, greatly increases the chances that rabies will develop.<sup>7</sup> Intradermal vaccination, recommended by the World Health Organization in low-resource settings, has been practiced recently in India because of its lower cost and high immunogenicity. However, it requires special training to reduce the risk of insufficient dosing. Sometimes patients are advised to watch the offending animal for abnormal behaviour for 10 days after a bite before seeking prophylactic treatment, but because animals can be asymptomatic carriers, such delay can be risky.<sup>8,9</sup> It would be safer to administer the complete course of anti-rabies vaccination to anyone who gets bitten by an animal.

Given the conditions that prevail in India, several measures must be taken to control rabies effectively. Public education campaigns need to be conducted to make people aware of the existence of rabies, especially in remote areas, and of the vital importance of seeking medical care immediately after an animal bite. Steps must be taken to ensure the uninterrupted availability of vaccines and anti-rabies immunoglobulin in all hospitals and in remote primary-health-care centres. Primary care providers should be trained to administer proper prophylaxis, including intradermal vaccination. Medical colleges need to provide interns with sufficient training and exposure to animal bite management. The primary school curriculum should include developing rabies awareness among students. All dogs should be given the oral vaccine against rabies through baits (i.e. dog foods laced with oral rabies vaccine) and stray animals should be sterilized to reduce the vector population. Rabies should be declared a

notifiable disease and incorporated into a "one health programme" in a coordinated manner at all levels. Lastly, in light of the availability of highly efficacious, safe and cost-effective cell-culture-derived anti-rabies vaccines, all children, who are the most frequent victims of bites, should be vaccinated against rabies as pre-exposure prophylaxis, particularly in areas with an uncontrolled dog population. ■

### References

1. Knobel DL, Cleaveland S, Coleman PG, Fèvre EM, Meltzer MI, Miranda ME et al. Re-evaluating the burden of rabies in Africa and Asia. *Bull World Health Organ* 2005;83:360–8. PMID:15976877
2. Gongal G, Wright AE. Human rabies in the WHO Southeast Asia Region: forward steps for elimination. *Adv Prev Med* 2011;2011:383870. doi: <http://dx.doi.org/10.4061/2011/383870> PMID:21991437
3. Dutta JK. Human rabies in India: epidemiological features, management and current methods of prevention. *Trop Doct* 1999;29:196–201. PMID:10578630
4. Sudarshan MK, Madhusudana SN, Mahendra BJ, Rao NS, Ashwath Narayana DH, Abdul Rahman S et al. Assessing the burden of human rabies in India: results of a national multi-center epidemiological survey. *Int J Infect Dis* 2007;11:29–35. doi: <http://dx.doi.org/10.1016/j.ijid.2005.10.007> PMID:16678463
5. Ichhpujani RL, Chhabra M, Mittal V, Bhattacharya D, Singh J, Lal S et al. Knowledge, attitude and practices about animal bites and rabies in general community—a multi-centric study. *J Commun Dis* 2006;38:355–61. PMID:17913213
6. Chowdhury R, Mukherjee A, Naskar S, Lahiri SK. A study on knowledge of animal bite management and rabies immunization among interns of a government medical college in Kolkata. *Int J Med Public Health* 2013;3:17–20.
7. Song M, Tang Q, Wang DM, Mo ZJ, Guo SH, Li H et al. Epidemiological investigations of human rabies in China. *BMC Infect Dis* 2009;9:210. doi: <http://dx.doi.org/10.1186/1471-2334-9-210> PMID:20025742
8. Zhang YZ, Xiong CL, Zou Y, Wang DM, Jiang RJ, Xiao QY et al. Molecular characterization of rabies virus isolates in China during 2004. *Virus Res* 2006;121:179–88. doi: <http://dx.doi.org/10.1016/j.virusres.2006.05.010> PMID:16828520
9. Warner CK, Schurr TG, Fekadu M. Molecular characterization of carrier rabies isolates. *Virus Res* 1996;41:133–40. doi: [http://dx.doi.org/10.1016/0168-1702\(96\)01282-8](http://dx.doi.org/10.1016/0168-1702(96)01282-8) PMID:8738172

<sup>a</sup> Department of Medicine, Infectious Diseases Hospital 57, Beliaghata Main Road, Kolkata-700010, West Bengal, India.

<sup>b</sup> BP Poddar Hospital & Medical Research Institute, Kolkata, India.

Correspondence to Alakes Kumar Kole (e-mail: dralakeskole72@gmail.com).