

REVIEW ARTICLE

Burden of rabies in India: the need for a reliable reassessment

Maroof KA

Assistant Professor of Community Medicine, University College of Medical Sciences and GTB Hospital, University of Delhi, Delhi

Abstract	Introduction	Conclusion	References	Citation
--------------------------	------------------------------	----------------------------	----------------------------	--------------------------

Article Cycle

Address for Correspondence: Dr. Khan Amir Maroof, Assistant Professor of Community Medicine, University College of Medical Sciences and GTB Hospital, University of Delhi, Delhi
E Mail ID: khanamirmaroof@aol.com

Citation

Maroof KA. Burden of rabies in India: the need for a reliable reassessment. *Ind J Comm Health*, 25(4); 488 - 491

Source of Funding : Nil, **Conflict of Interest:** None declared

Abstract

Published literature addressing the issue of burden of rabies in India is scarce. Even the estimates of burden of rabies that are available from various studies differ considerably among themselves and as new data pour in, the earlier available figures are becoming further questionable. It has been almost a decade that a nationwide community based study was done to directly assess the burden of rabies in India. The figures reported by this study is still the most quoted one in published literature. Since this nationwide study has been conducted, there may have been considerable changes in the human and canine demographics as well as the other determinants of rabies at the community level. Policy makers find it difficult to move ahead in planning for rabies control, in the absence of any reliable and evidence based data. The time has come to redesign and redevelop a scientifically robust study design and undertake a nationwide survey to find out the burden of rabies in India.

Key Words

Rabies; burden; India; epidemiology

Introduction

Rabies is an almost 100% fatal disease and at the same time it is almost 100% preventable. The developing countries contribute to more than 99% of the total rabies deaths reported worldwide. (1)

The data on rabies burden in the developing countries is available from modeling techniques. Knobel D et al in 2005 have reported an annual incidence of 55,000 deaths in the developing countries. The data available from these developing countries were linked to a set of epidemiological and economic

models developed for the purpose. The authors also have mentioned that although an attempt was made to incorporate all the available parameters, still the figures may be an underestimate of the actual cases. The possibility of this underestimate is that; as these models were based on the available data reported from various healthcare settings; and these reported cases are themselves an underestimate of the true cases in the community.(2)

From 1985, India reported every year about 25,000 to 30,000 human rabies deaths, which accounted to about 60% of the global report of 50,000. However, these figures were an

estimate worked out, based on the projected statistics of isolation hospitals in the country.(3) It is estimated that India accounts for 36% of the world's deaths due from rabies i.e. 20,000 out of which, about half of the cases are among children and most of the cases in rural areas.(4) Across Asia the annual expenditure due to rabies is estimated to be reaching 563 million USD.(5) Most of the data available regarding burden of rabies in India is an extrapolation of some indirect estimates.

Discrepancies in the reports on burden of rabies in India

Different studies have projected different figures about the burden of animal bites and rabies and even the methodology used by various studies vary considerably from each other. The only nationally representative study on burden of dog bites and rabies in India was done in 2003 and was sponsored by the World Health Organization. The annual incidence of animal bite has been reported as 1.7% from this study.(3) There was an incredible variation in the standardized measure of incidence across the studies. A comprehensive review has reported that the standardized estimates of the disease incidence for each study, ranged from 0.05 to 1700 rabies cases per 100 000 population. Most were hospital based studies and in most of the studies case definitions were also not reported. It also reports that some studies have overestimated the figures on rabies burden in India.(6) This highlights the amount of variation reported by different studies on the same topic.

The currently ongoing Million Death Study which uses enhanced types of verbal autopsy is a representative survey of 1, 22,000 deaths in India. This study reported that, based on the analysis of data from the Million Death Study, in 2005 there were 12,700 (99% CI 10,000 to 15,500) symptomatically identifiable furious

rabies deaths in India. The overall rabies mortality rate was 1.1 deaths per 100,000 population (99% CI 0.9 to 1.4).(7) Based on the findings reported from the Million Death Study, it seems that the widely accepted data of 20,000 deaths due to rabies is an overestimate. Even though the data from the Million death study has reported the drawbacks of its own data analysis regarding rabies deaths and estimating rabies cases; it certainly seems to present a scientifically more sound method of arriving at the estimates.

Even the model used by Knobel et al(2) in estimating the burden of rabies in India has not taken into account any mortality statistics from India and the rabies deaths were calculated independently from a probabilistic model based on hypothetical human – canine density, post exposure treatment and regional demographic features.(7)

There is a lack of any surveillance for rabies in India and rabies is not a notifiable disease. Most of the cases of dog-bites do not consult a healthcare provider, thus making it further impossible to keep a tab on the exact burden of the dog-bite cases, even using the data from the healthcare delivery system. Not only cases of dog-bites, even cases of rabies, both in animals and in humans is not known due to the lack of availability of extensive laboratory facilities for diagnosing rabies cases. Based on epidemiological modeling and comparing with WHO data, one study has reported that there is an underreporting of rabies deaths by up to 10 times.(2) There is a variation in the estimate of burden of rabies in India.

Need for an objective reassessment of the burden of rabies in India

In the endemic countries, it has been recommended that comprehensive national programme for rabies control should be established.(8) This should include the

incidence of dog-bites and rabies and also the economic burden of these on the community. Epidemiological studies will help identify the current risk factors of dog-bites and rabies deaths. Rabies has been identified as a priority zoonosis in India by the Government of India and it will be targeted through a set of focused strategies.(9)

There is no strong evidence base to inform this well intentioned strategy of controlling rabies at the national level.(10) A national consultation of rabies researchers, program managers and policy makers organized recently in Chennai, India, reviewed the policy landscape of rabies control in India and recognized the fact that rabies-related policy making has largely been conducted in isolation, with little contribution from local research.(11)

One reason for the policy makers to be hesitant in moving ahead to control and prevent rabies in India is a lack of authentic data that can be used to plan strategies for control that can be justified. Hence, there is a need to collect accurate and reliable data about these characteristics. This will help in planning for the control and prevention of rabies. Also, accurate and justified allocation of resources can be done for the strategies to be devised for controlling rabies. Clearly, further research will be required in order to produce a better estimate of the incidence of rabies in India.(6)

Conclusion

Rabies, a neglected zoonoses, is an endemic disease in India. As discussed, research on rabies in India is also not aligned to the needs of the policy makers. A decade old survey report which did a community based assessment of the burden of rabies in India seems to be an inadequate estimate to plan for future rabies control strategies. In order to

assist policy makers to move ahead in designing strategies for rabies control, there is a need to undertake a nationwide survey on rabies burden in India using a robust and scientifically valid technique.

References

1. WHO. World Survey of Rabies No. 32 [Internet]. 1996. Available from: https://extranet.who.int/iris/restricted/bitstream/10665/64429/1/WHO EMC_ZDI_98.4.pdf
2. Knobel DL, Cleaveland S, Coleman PG, Fèvre EM, Meltzer MI, Miranda MEG, et al. Re-evaluating the burden of rabies in Africa and Asia. *Bulletin of the World Health Organization* [Internet]. 2005 May;83(5):360–8. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2626230&tool=pmcentrez&rendertype=abstract>
3. Sudarshan M. Assessing Burden of Rabies in India : WHO Sponsored National Multicentric Rabies Survey, 2003. *Indian Journal of Community Medicine* [Internet]. 2005;30(3):100. Available from: <http://www.ijcm.org.in/text.asp?2005/30/3/100/42864>
4. Chatterjee P. India's ongoing war against rabies. *Bulletin of the World Health Organization*. 2009 Dec;87(12):890–1.
5. Dutta JK. Human rabies in India: epidemiological features, management and current methods of prevention. *Trop Doct*. 1999;:196–201.
6. Baxter JM. One in a million, or one in thousand: What is the morbidity of rabies in India? *Journal of global health* [Internet]. 2012 Jun [cited 2013 Feb 10];2(1):10303. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3484763&tool=pmcentrez&rendertype=abstract>
7. Suraweera W, Morris SK, Kumar R, Warrell DA, Warrell MJ et al. PLOS Neglected Tropical Diseases Deaths from Symptomatically Identifiable Furious Rabies in India A Nationally Representative Mortality Survey. *PLoS Negl Trop Dis* [Internet]. 2012;6(10):e1847. Available from: <http://www.plosntds.org/article/info:doi/10.1371/journal.pntd.0001847>
8. Bourhy H, Dautry-Varsat A, Hotez PJ, Salomon J. Rabies, still neglected after 125 years of vaccination. *PLoS neglected tropical diseases* [Internet]. 2010 Jan [cited 2013 Feb

- 12];4(11):e839. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2994912&tool=pmcentrez&rendertype=abstract>
9. Planning Commission G of I. Report of the Working Group on Disease Burden for the 12th Five Year Plan [Internet]. New Delhi: 2011. Available from: http://planningcommission.nic.in/aboutus/committee/wrkgrp12/health/WG_3_1communicable.pdf
10. Kakkar M, Venkataramanan V, Krishnan S, Chauhan RS, Abbas SS. Moving from rabies research to rabies control: lessons from India. PLoS neglected tropical diseases [Internet]. 2012 Jan [cited 2013 Jan 29];6(8):e1748. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3413711&tool=pmcentrez&rendertype=abstract>
11. Manish Kakkar, Syed Shahid Abbas, Bhavna Raghuvanshi, Vidya Venkataramanan. Report on National Expert Consultation on Rabies Control in Tamil Nadu: 9-10 August, 2011, Chennai. [cited 2013 Feb 12]

-----x-----